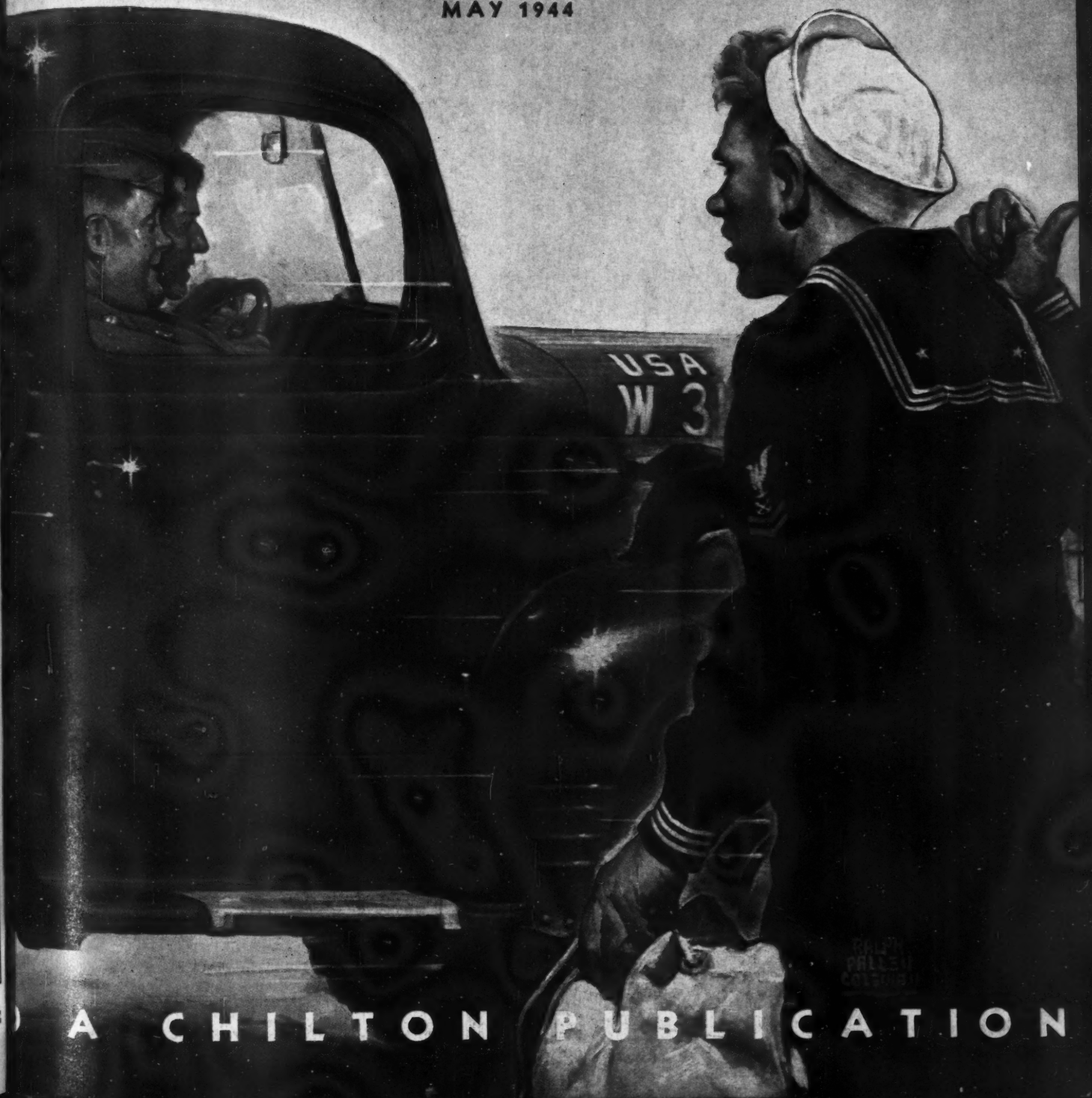


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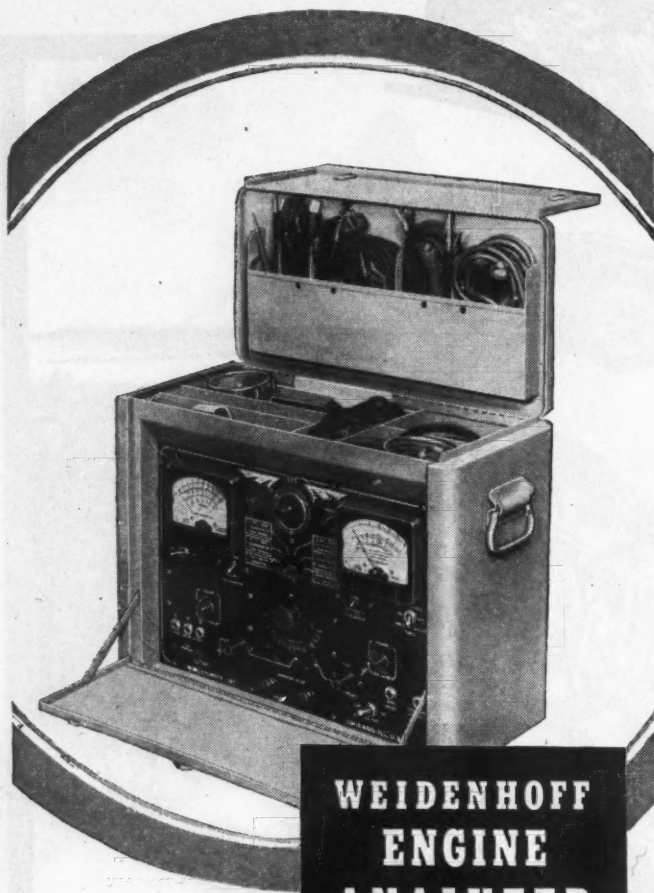
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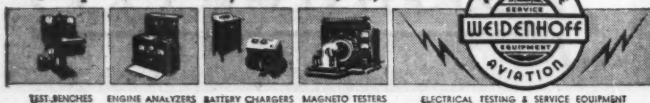
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MOTOR AGE

With Which Is Combined AUTOMOBILE TRADE JOURNAL

FOR AUTOMOTIVE SERVICEMEN

Vol. LXIII, No. 6

May, 1944

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Automotive Division

Jos. S. HILDRETH, President and Manager

JULIAN CHASE, Vice Pres.

G. C. BUZBY, Vice Pres.

Offices: Philadelphia 39, Pa.—Chestnut & 56th Sts., Phone Sherwood 1434.
New York 17, N. Y.—100 E. 42nd St., Phone Murray Hill 5-8600. Chicago 1, Ill.—Room 916 London Guarantee & Accident Bldg., Phone Franklin 4243.
Detroit 2, Mich.—1015 Stephenson Bldg., Phone Madison 2090. Cleveland 14, Ohio—609 Guardian Bldg., Phone Cherry 4188. Washington 4, D.C.—1061 National Press Bldg., Phone District 8100, 8110. San Francisco 5, Cal.—605 Market St., Room 708, Phone Douglas 0967. Los Angeles 1, Cal.—6000 Miramonte Blvd., Phone Lafayette 5525. Member of Audit Bureau of Circulations. Member of Associated Business Papers, Inc. Subscription Price: United States and Possessions, Latin-American Countries, \$2.00 per year; Canada and foreign, \$3.00 per year. Single copies, 25c.

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SLANTS ON THE

News

**Changes in Distribution
Of Parts Are Discussed**

A GOOD deal of study remains to be done before proposals of certain car factories to distribute parts through parts jobbers can be put into operation to the satisfaction of the entire industry. Replacement parts makers, jobbers, and retailers all would be affected by the plan and their feelings on the subject are mixed.

Manufacturers who supply parts for both original equipment and replacement could find their replacement parts in competition on jobbers' counters with identical parts supplied by the car factories. Jobbers, if they attempted to stock the slow-moving parts from car factories along with fast-moving items, would have to expand their storage facilities. The many car dealers that do a large and profitable business of selling factory parts to independent shops fear they would lose a share of their parts volume to the jobbers.

The proposal has undergone some change since it was originally made and the changes have overcome much opposition. Perhaps continued discussion of the problem will eventually reach a solution. In any event, it is a development well worth attention, for the booming post-war service market will create

an unprecedented demand for replacement parts. Manufacturers with the best distribution system will be in the best position to realize on that market.

**Draft of Key Men Threat
To Production of Tires**

BY making factory-second synthetic-rubber tires available to holders of "B" gas books, following the recent termination of passenger car tire inspections, the OPA has given rise to some speculation that the tire situation has improved. This is contrary to advice from the Office of Rubber Director.

In a supplement to his Progress Report No. 5, Bradley Dewey questions whether the production of tires, already lagging behind the goals set so optimistically last year, would not be further reduced by the drafting of key men under the latest demand for men under 26. The report shows that technicians between 22 and 25 in the rubber-

goods manufacturing industry total only 492, not a large enough number to impede military plans but of vital importance to this industry. In the synthetic-rubber industry, the number of draft eligible technicians between 22 and 25 is only 390.

It remains to be seen whether these young technicians will be deferred. If they are not, the effect may easily be felt by the entire country in reduced production of automobile tires.

**Will Kaiser Move Set
Trend for Car Factories?**

IN moving his Michigan Kaiser Co. from Detroit to Bristol, Pa., Henry J. Kaiser draws attention to a wartime development that may have echoes in the post-war era. War plants, for one reason or another, have been built in cornfields and wheatfields and have suffered no inconvenience in obtaining either material or labor. This fact has led to speculation that the post-war era may bring a decentralization of industry.

The Kaiser firm implies that it will return one day to Detroit, perhaps to produce the much-heralded \$400 car, but such a move would not be made for lack of manufacturing space elsewhere. The location at Bristol, Pa., is the Kaiser-

With anti-friction bearings harder than ever to obtain, you can't afford to miss the article on the servicing of front-wheel bearings on Page 20. Dealers will be interested in the story on Page 28 of a shop that boosted its service volume by featuring mechanics.

controlled Fleetwings aircraft division and there are Kaiser wartime plants scattered across the country.

Any established or newly formed automobile company, looking for plant space outside the Detroit area, would have not the least trouble finding it after the war. Whether they will be inclined to shift all or part of their operations to such plants is another matter. Procurement of labor and material would not be an obstacle in most sections of the country, but Detroit is still synonymous with automobile production, and considerable advantage would have to be promised to induce established companies to withdraw from the area. Whether such advantage will be offered is a question that cannot be answered until the country returns to a peacetime footing.

Rumors of Bigger Gas Allotments Unfounded

RUMORS of increased gasoline rations enlivened conversation among motorists last month.

On the West Coast, gossip became general that gasoline tanks in that region were overflowing and that the only way of overcoming the storage difficulty was to increase allotments. Acting Petroleum Administrator Ralph K. Davies promptly spiked that one with the declaration that stocks on the Pacific Coast are close to the minimum.

Later in the month, newspaper articles announced, apparently with the knowledge of some few officials, that rations for "B" book holders would be upped. The next day, higher officials denied that such an increase had even been contemplated.

Gasoline rationing is an annoyance and, in some instances, an actual hardship, but rumor mongering is not easing the situation. Anyone who helps to spread groundless reports of increased gasoline supplies before the war in Europe is over is raising hopes that cannot be realized. In fact, one PAW official has predicted that even the gas to

be made available will give motorists fewer miles in the future, as it will be necessary to lower octane numbers still further.

Shortage of Bearings Hampers Truck Repairs

THE parts shortage is beginning to get the attention it deserves. Engine bearings continue to plague everyone who has anything to do with them. Ball and roller bearings are scarcer than ever and their scarcity has some vehicles up against a wall. Gears of some types are simply non-existent.

Incidentally, fenders are likely to undergo some changes—when they are made again.

Right now, and perhaps for sometime after the war, there would be a serious engineering problem to be solved before fenders could be made at all. The steel scrap pile, which is necessary to most any kind of steel production, contains so much alloy steel that there would not be enough good low-carbon steel available for fenders. With the alloy in the scrap, the fender maker would get hardness where he does not want it. The alloy steel cannot be drawn deep enough to make some of the long front fenders. They would probably have to be made in two pieces.

1943 Second Best Profit Year for Pontiac Dealers

A RECENT statement by Earl C. Gouldman, business management manager of Pontiac, makes some extremely interesting revelations of dealer business under wartime conditions. The most striking of the revelations is the fact that 1943 was the second highest profit year in history for Pontiac dealers. An increase over 1942 was realized in every department.

Despite the scarcity of certain types of parts and the shrinkage of labor supply, the dealers boosted their customer labor sales by 21.6 per cent and their sale of parts by 17 per cent.

Used-car departments made a

gross profit of 60.2 per cent higher than in 1942 and the net profit per \$1,000 of retail sales increased 84.1 per cent. The total sales of all departments showed an increase of \$24,606,156 over 1942.

No better evidence is needed to show that the American automobile dealer knows how to ride the pun and come back fighting.

Farms May Supply Part Of Post-War Gasoline

MOTOR fuel from the farm is not a new development. Grain alcohol has been used in motor vehicles, either alone or blended with mineral fuels, for years. Yet the recent announcement by the American Chemical Society that Dr. E. Berl, of Carnegie Tech, has been able to produce gasoline from agricultural products presents the development in a new light.

Details on the new process are lacking, but it suggests interesting possibilities. Reserves of mineral fuel are still abundant, despite recent attempts to make it appear otherwise, so the possibility of raising gasoline on the south forty will not be a necessity for years, if ever. The real interest attaching to the new development is the emphasis it places on the new approach to old problems, a tendency that can change materially the products and habits of thinking to which we will have to accustom ourselves after the war.

Dope for the Gasoline Is Dope for the Buyer

A LONG with counterfeit coupons and the other evils coming in the train of gasoline rationing must be counted the revival of fuel "dopes." Probably there never has been a time when tablets and liquids, allegedly possessing the power to transform ordinary gasoline into super fuel or to change a quarter into a gallon, have been promoted so assiduously among gullible automobile owners. They have been advertised extensively and persuasively, and buyers have

learned the hard way that they and not the fuel additive deserve the term "dope."

The National Bureau of Standards has tested hundreds of these "magic" formulas and its conclusion is that none of those used in small amounts, such as an ounce or so per gallon of gasoline, has any noticeable effect, good or otherwise. If the "dope" has to be used in large quantities, it also is open to question, since even straight gasoline, added to gasoline already in the tank, will, strangely enough, improve mileage.

It is not easy to save people from their own folly but servicemen who have any interest at all in their customers will continue to tell them the truth about "dopes."

Used Car Ceilings Await Congress Action on OPA

REGARDLESS of what automobile dealers consider wise, from the standpoint of their own operation, price ceilings on used cars seem inevitable. The best advice from the Capital is that the long delay in imposing the ceiling has not been caused by any doubt on the part of OPA that maximum prices are advisable but by the disposition of Chester Bowles to wait to see how the Congressional cat is going to jump on the extension of price regulating authority.

As pointed out before in these columns, the logical date for fixing prices on used cars, if it ever existed, has long since passed. Although there will probably be day-by-day increases as long as the war goes on, the abrupt upswing ended weeks ago. It is doubtful that prices have risen in recent weeks as much as the increment allowed on new 1942 cars up to April 30. If the object of price ceilings is to protect the public, the time to have invoked them was two years or more ago.

Since Bowles has given no hint as to when ceilings might be expected, it would help no one to make guesses, but dealers have the assurance of the OPA that maxi-

mum prices will not be effective until 30 days after their announcement.

Shops Must Intensify Efforts to Retain Men

ALTHOUGH the draft situation has been muddled disgracefully, and neither prospective draftees nor industry can rely upon the statement of any Selective Service or Manpower Commission official any longer than it takes the official to make a new statement, it is becoming apparent that every employer will have to prepare for further losses in trained personnel.

There does not seem to be much hope, if present arrangements hold, to keep any able-bodied man under 22. Men from 22 to 26 apparently will be deferred for the production of actual war goods but only when their special skills makes them irreplaceable. For men 26 to 36, the situation remains substantially as it has been since the draft began to take married men; they will be deferred when their essentiality to vital industry can be shown.

All sources of new service personnel have been tapped, and all are virtually exhausted with the exception of unskilled teen-age boys. Women have generally been found to be limited in their ability to replace men in automotive shops, and the veterans being released from the Army usually are not able physically to assume the full burden of a journeyman mechanic.

The surest source of future mechanics is a shop's present force. Efforts to retain the men now employed should be intensified. This can best be done by forming strong

What are the prospects of getting new cars before the war ends? The meeting last month between factory officials and the WPB explored the question thoroughly. An inside report of the meeting appears on Page 23. There is an article about cylinder wear on Page 26 that every mechanic will want to read.

local and state manpower committees, where this has not already been done, and by making a careful survey of the local manpower situation.

No plan can guarantee that military requirements will not rob a shop of even desperately needed men, but the manpower committees, working in cooperation with the Select Service and Manpower Commission, offer the best at present of retaining a labor force of minimum size and skill.

Civilian Truck Output Lags in First Quarter

WHILE civilians received so few new trucks last year that the effect was hardly noticeable, total truck production in 1943 compared favorably with the best peacetime years. Production for 1943, according to the Automotive Division, WPB, was 675,502 vehicles. Since only 7,500-odd trucks found their way into civilian hands, the remainder went to our own and Allied armed forces, government agencies, and Lend-Lease.

Production for civilian use during the first quarter of this year amounted to 10,329 vehicles. This leaves 113,000 trucks to be built during the last nine months if the year's quota, set by the WPB, is to be reached.

It is too early to despair of reaching the goal, but the obstacles do not grow fewer.

Change in L-158 Fails To Assure More Parts

UNCERTAINTY exists in the industry as to the benefit to be derived from the latest amendment to Limitation Order L-158. Under this order, parts makers are permitted to schedule up to 5 per cent of their total facilities for the production of bus and truck replacement parts for civilian use.

The use of "may" instead of "must" in the amendment leaves the scheduling to the manufacturer's discretion. A great many factories had been devoting 10 to 30 per cent of their production facilities to civilian parts

(Continued on page 76)



Front

These tips on servicing



1. Jack up the wheel clear of the floor. Remove the hub cap and the grease-retaining cap from the wheel hub. Remove the cotter pin or locking washer from the spindle nut and remove the nut. Where a locking washer is used on the spindle nut, it is necessary also to remove the adjusting nut. Slide the wheel toward the outer end of the spindle, being careful not to let the outer bearing drop to the floor. Now slide the wheel completely off the spindle to gain access to the inner bearing.

2. Clean all the bearing parts with a stiff brush and a suitable cleaning-solution. Remove all particles of hard grease from the bearings, the spindle and the inside of the hub. Thoroughly dry all of the parts, preparatory to inspection.

3. Carefully inspect the bearings. If the cups are pitted, they should be replaced. When replacing the cups, make

sure that they are pressed tight against the shoulder in the hub and that they are not cocked in the hub. Before installing the cups, examine the hub for cracks. If the cone or rollers are chipped or pitted, replace the assembly. Examine the grease seal and, if it shows signs of leakage or damage, replace it.

4. Pack the bearing cone and rollers with grease, either by hand or pressure

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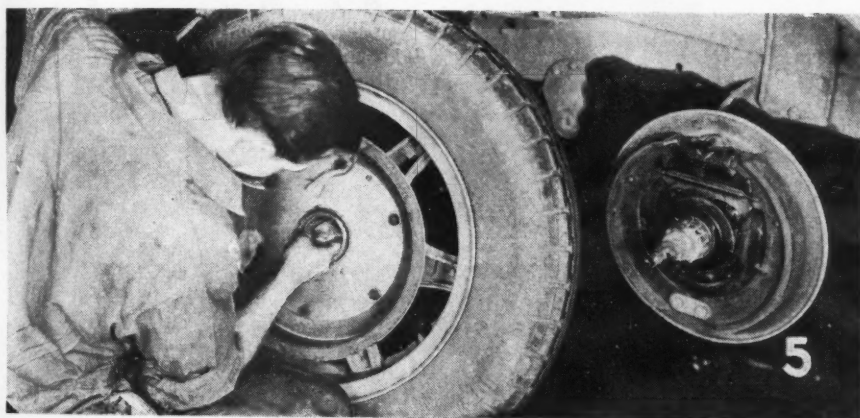
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Wheel Bearing

ADJUSTMENT

tapered roller bearings will help you to lengthen the life of hard-to-get parts



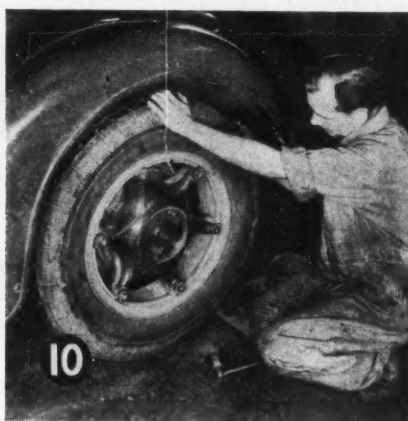
Photos courtesy Timken Roller Bearing Co.

7. Tighten up the adjusting nut until the wheel binds. At the same time revolve the wheel to make all working surfaces come into contact. Back off the adjusting nut enough to allow the wheel to rotate freely in both directions but without end play or shake.

8. Place a short bar between the tire and floor and work the bar up and down to test the adjustment. At the same time, hold one finger on the cage of the bearing to detect any excessive play or looseness. When a barely perceptible shake can be felt and the wheel will rotate when given a slight spin, the adjustment is correct.

9. After the correct adjustment is obtained, lock the adjusting nuts in place. If the jam-nut-type adjustment is used, bend the washer over the flats on the nut. If the adjusting nut is the castellated type, use a new cotter pin of the correct size, and bend the ends to hold the nut securely in place.

10. Test the adjustment again with the bar, spinning the wheel as before. When locking the jam nuts or aligning cotter-pin hole in the spindle with the slot in the adjusting nut, it is possible to change the bearing adjustment. The last operation is to pack the hub grease-retaining cap half-full of grease and cover the end of the spindle and the adjusting nuts with grease, then screw the cap into place and tighten it securely.



method. Be sure that the grease is thoroughly worked into all parts of the cone assembly. Do not allow any dirt or foreign matter to lodge in the grease. Replace the inner bearing cone assembly on the spindle, covering it well with grease.

5. Repack the inside of the hub with grease and make sure that it is half to three-quarters full. In the event the bear-

ings should heat up, there will be sufficient grease in the hub to run into the bearings and keep them properly lubricated.

6. Slide the wheel and hub into position on the spindle and replace the outer bearing cone assembly. Put the thrust washer on the spindle and screw the adjusting nut into position to hold the wheel. When placing the hub on the spindle, be careful not to damage the grease retainer.



Harry Coker, right, one of the two brothers who run the shop, discussing with a customer, the advisability of having tire recapped.

Though handicapped by wartime shortages of both men and supplies, this southern shop has found ways to broaden its automotive service and lay the groundwork for success when peace returns

By GEORGE H. WATSON

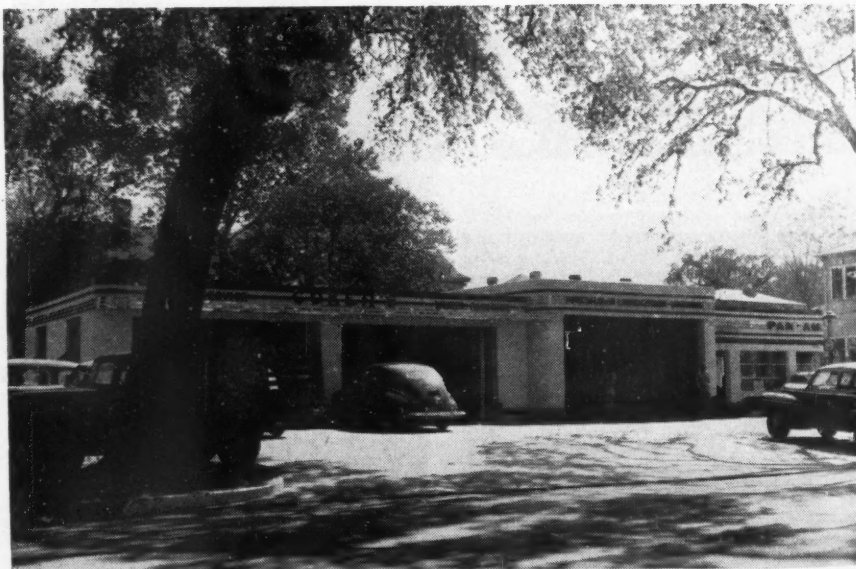
Post-War SUPER SERVICE *Now!*

WHILE other repairmen are discussing post-war problems and mentally sketching plans for the kind of shop they will operate after the war, the Coker brothers, of Mobile, Ala., are already conducting a "post-war" business. That, at least, is the belief of the brothers, whose super-service station is one of the most attractive and complete in Mobile.

Except for major engine overhauling and body painting, the Coker operation today is complete. The car owner can obtain any other type of service he needs and any supplies now available to civilians. The result is that the Coker station is as busy these war days as any shop in the city. Perry Coker, who has charge of fuel sales, the tire-service department, and the sale of used cars, is convinced that the excellent showing of the Coker enterprise is due entirely to the completeness of the services offered by the shop, and, further, that super service is going to be the formula for post-war success.

"I have noticed," he says, "that the shops getting along the best since the war began are the ones that have the most varied services to offer.

"From what I can learn, the tire companies and oil companies after



This is the inviting appearance the Coker shop presents to owner seeking one-stop service.

the war are going in for bigger and better stations. These big stations will provide every possible automotive service and sell more types of merchandise than the independent station ever thought of selling. They'll be managed by men who know merchandising as well as service.

"That's the kind of competition we independent operators are going to face. We've got to learn something besides pumping fuel and

straight mechanical work. We've got to match the merchandising skill of the big stations.

"I don't mean we've got to turn our shops into glorified five-and-ten-cent stores, like some of the manufacturer-operated stations we knew before the war. I don't think sporting goods, household appliances, toys, and a lot of other gimcracks have any place in an automotive establishment. Certainly

(Continued on page 52)

By DONALD BROWNE



C. E. Wilson, General Motors president, who acted as spokesman for industry group in discussion of plans to resume new-car production.

REPAIR PARTS

Avert Car Crisis

Factory executives tell WPB production can wait two years if present cars are properly serviced

NOT only did the conference between high automotive officials and the WPB at Washington April 17 and 18 decide definitely that there would be no production of new automobiles so long as either Germany or Japan remained in the war, but it also revealed some of the hitherto little-known complications attending re-

conversion of plants to peacetime production.

C. E. Wilson, president of General Motors, acting as spokesman for the automotive group, told WPB officials that it would not be feasible to produce new automobiles at a reasonable cost unless sufficient material and labor could be guaranteed to turn out a mini-

mum of 2,000,000 cars. Since no such guarantee could be given, WPB officials did not press for acceptance of the rumored plan to ask production of a much smaller number of cars for emergency use.

The need for limited production at this time was denied by automotive men. They argued that any threat to civilian transportation through lack of new passenger cars could be averted for the next two years if the WPB provided enough repairs. According to a statement made later at Detroit by George T. Christopher, Packard president, the WPB had approved the re-installation of production lines in car factories for expanded production of replacement parts. Christopher said that Packard and other leading car factories are already setting up production lines for the production of such parts as crankshafts, the supply of which has been exhausted. Re-installation of such lines will not only ease the shortage of critically needed parts, but should also shorten the time required to convert automobile plants for car post-war production.

John Middlekamp, WPB Automobile Division director, said that every effort was being made by WPB to maintain a high repair-part production level, but, if it develops that increased production is needed, something will have to be done about it. In the case of the Packard and the Nash companies, increased repair part production would mean that additional plant and manpower would be needed.

Lucius Tompkins, assistant WPB rubber director, told MOTOR AGE that the planned production of 22,000,000 automobile tires a year for the next two years should be adequate to take care of the estimated 21,000,000 cars on the roads on the basis of a need of one tire per car per year.

Not all the meeting was spent in agreement. C. E. Wilson of GM and Paul G. Hoffman, president of the Studebaker Corp., got into a heated discussion over the question of manufacturing quotas when car production is resumed. Hoffman was joined by George W. Mason, of the Nash-Kelvinator Corp., and Powel Crosley, president of the Crosley Corp., who both declared that they could not survive the re-conversion period if their companies were restricted to a per-

(Continued on page 82)

Servicing Universal

In the 29th article of a series for beginners, Pop O'Neill reveals one source

It was after 6 o'clock in the evening and Pop O'Neill was alone in the shop when Tommy Winters returned with Dr. Fay's car. Usually, Pop would not have let an apprentice road test a car but tonight he was anxious to get home to dinner and was confident that the vibrations of which Dr. Fay had complained had been licked. While Tommy had the car out, Pop had washed up and changed his clothes.

"Well," he said hopefully as Tommy drove in, "we licked it, didn't we?"

Tommy stepped out of the car and shook his head. "It's just as bad as ever," he said. "The faster I drove, the worse it got."

With visions of his dinner being pushed to the back of the stove, where it would lose its appetizing appeal by the time he got home, Pop was in no mood to surrender without an argument.

"Are you sure?" he asked.

"It sounded awful bad to me," said Tommy. "You can take it out yourself if—"

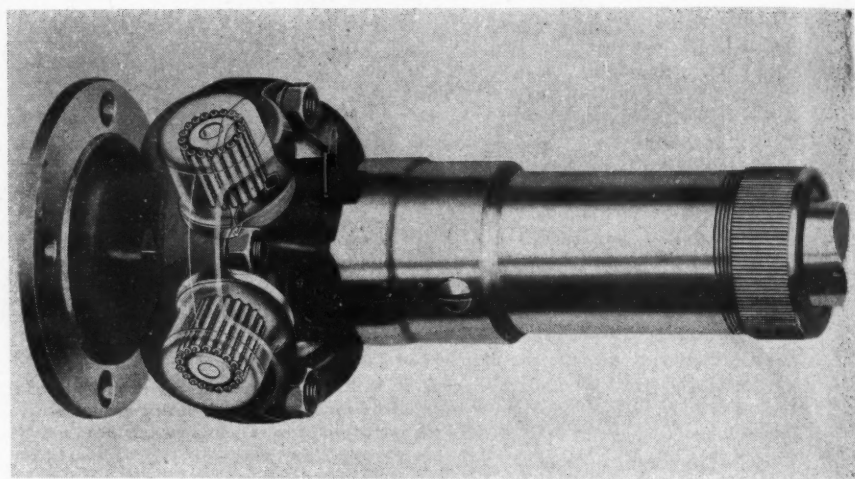
"Oh, I believe you, all right. But it gripes me to have to start all over. I thought that balancin' the wheels would be the answer. You helped Larry balance 'em, didn't you?"

"Sure. He said he hoped they'd be okay, because he was gettin' tired of workin' on this crate."

"Doc Fay has been havin' a lot of trouble with it lately. What was it we done the last time it was in? Do you recall?"

Tommy squinted at the roof a second. "It seems like we did something underneath it," he said, "like taking out the propeller shaft."

Pop smacked his forehead with an open palm. "Why didn't I think of it?" he exclaimed. "We put in



A familiar design of the commonly used cross-type of universal joint, employing split ring.

By J. EDWARD FORD

a whole new front universal joint."

"But," said Tommy, "if we put in a new joint, what makes you think that's where the vibration is?"

"It's got to be," said Pop. "We've checked everything else." He started to take off his coat. "We'll get under there and have this job out of here in two shakes." He went to the wash room and returned, wearing his coveralls.

"I still don't see—" began Tommy.

"Get a creeper," said Pop. "We'll have a gander at the propeller shaft."

Stretching out on the creeper and grasping a trouble lamp, Pop pushed himself under the car. Tommy followed. Pop let the lamp shine on the forward end of the propeller shaft.

"Just as I thought," he said. "Sloppy work. See those arrows—the one on the shaft and the other on the joint? They ought to match up, but they don't. Larry musta been in too much of a hurry. Now we've got to remove the shaft and put it back so it balances."

"How could those arrows not being matched up cause all that vibration?" asked Tommy.

"The propeller shaft is unbalanced. Let's jack up this crate and get the job done. I want to get home to dinner."

Because he wished to lose no time, Pop did the work himself, after Tommy had jacked up the car. Tommy wanted to be helpful but there was nothing he could do. He was still a little puzzled about the importance Pop attached to balance in the propeller shaft.

Points

of mysterious vibration

"I still don't see how it makes any difference," he said, "whether the shaft is hooked up one way or the other. It's round."

Tommy's question was natural enough, but it was not one to speed Pop on his way to dinner. No matter how busy he was, Pop could never resist a question from a mechanic in his shop or from a helper. It was not a case of showing off the knowledge he had gained from years of working on automobiles but of a belief that a mechanic did a better job when he understood the theory behind his work.

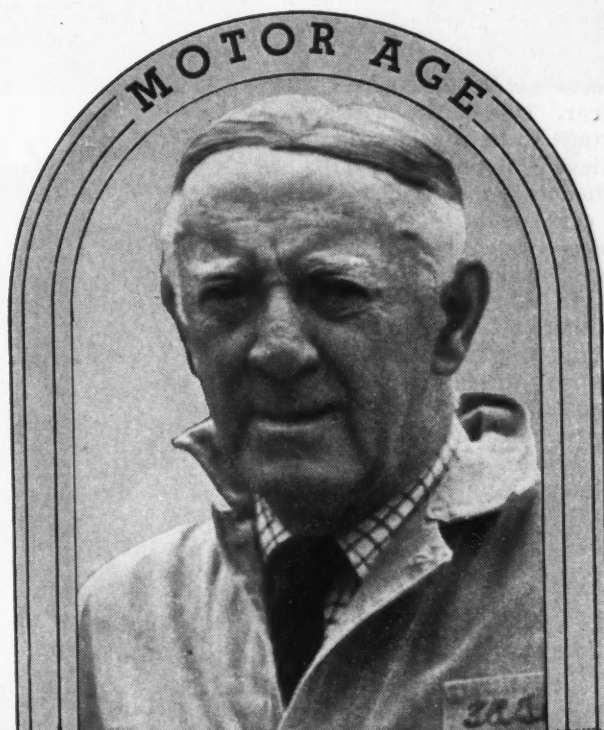
"You're pretty near right," Pop said to Tommy as he pushed himself from under the car, "as far as you go. If the shaft was perfectly true, it would be in balance no matter how it was attached to the front universal. But it don't take much to throw a long shaft out of dynamic balance. And, in a car like the one we're workin' on, there's the rear universal to worry about."

He could tell, from Tommy's frown, that his explanation was not taking. He wiped his hands while Tommy was lowering the car. "I got a manual in the office," he said, "that'll show you what I mean." When they reached the office, he pulled down a grease-stained volume and opened it to the section on universal joints.

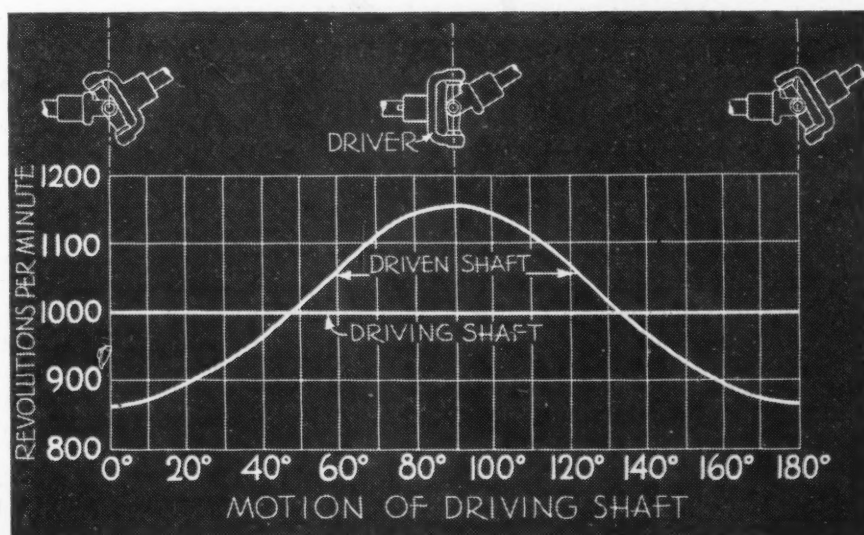
"Here," he said, sitting down at his desk, "is the kind of a layout we was just workin' on. These diagrams here show why the joint is necessary. You know all about that, I guess."

"It's on account of the way a car's built," answered Tommy. "The transmission is fixed to the frame but the rear axle is fastened

(Continued on page 58)



BASIC COURSE for MECHANIC TRAINING

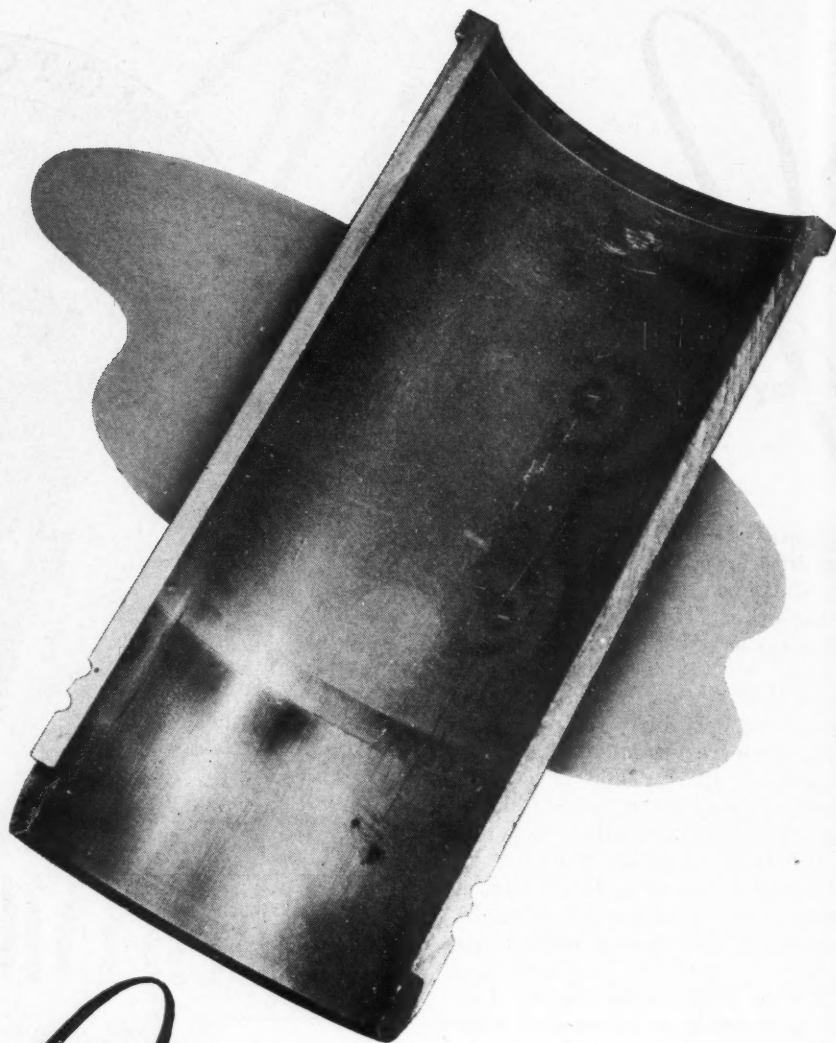


Variation in speed of the driven shaft when the angle between the shafts is 30 degrees.

MANY factors enter into cylinder wear. One of the most important to be considered, points out Alex Taub in a recent article in *Automotive and Aviation Industries*, is corrosion.

Cylinder wear varies with the type of service to which the engine is subjected. In door-to-door service, without thermostat or crankcase ventilation, it is possible completely to destroy present-day engines in a single winter or in less than 3,000 miles. However, in a test run with six cars over 100,000 miles, the cylinder wear averaged only .001 in. per 140,000 miles. Both these conditions are abnormal and have little bearing on wear in engines under normal operating conditions.

Were it not for corrosion, cylinder-bore wear would result in a reasonably uniform increase in diameter over the whole range of piston-ring travel. Actually, it conforms to a general pattern, being at a maximum at the point where the piston rings reach the top of their travel, then tapering down from there for a distance of 2 to 3 in., at which point it be-



Corrosion Hastens CYLINDER WEAR

comes uniform again. Frequently, where severe corrosion takes place, a pock-marked band can be seen extending upward from the bottom of the ring travel about 1 in., giving the impression that corrosion has taken place only in this area. Upon careful examination, it will be seen that the entire area of ring travel has been affected and that the products of corrosion have been scraped off in the area between the pock-marked section and the top of the ring travel, leaving the cylinder-barrel surface bright.

A protective measure against bore corrosion is the use of short cylinder-bore inserts, partially

austenitic, partially stainless, which give an acid-proof surface where there is danger of attack by corrosive elements.

Where corrosion in the bore occurs, the temperature of the metal is lower than that at which the acid becomes active, and the etching process goes on during the warm-up period. This condition is worse in sections of the country

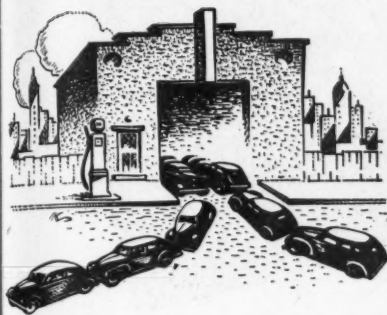
where winters are severe. The main factors in corrosion control are:

1. Thermostatic control of coolant outlet temperature at not less than 145 degrees, 165 degrees being preferable.

2. Crankcase ventilation to dissipate blow-by gas and prevent contamination of the lubricant.

(Continued on page 72)

What Makes a Small Shop Big?



By ROSE LU DE WINDT

ON the corner of Seventh and Seneca Avenues in downtown Seattle, Wash., stands Hartley's Garage. Automobile men in Seattle have tended toward big shops. Expansion and large scale operations are frequent and the city has great chains of service stations.

But not so Hartley's. Compared in size with neighboring downtown shops, this one is small. In accomplishment — in quality and quantity of work turned out—well, that's another matter.

Eleven years ago, on borrowed capital of \$350, Warren C. Hartley opened a shop at his present site. The other day, with a full and busy shop, and with a comfortable cash balance stored away, he was able to buy his building. With the help of two other mechanics, he turns out an average of 25 to 30 repair jobs a day and grosses about \$35,000 a year. He does all kinds of repairing on all makes of cars. He has never specialized, for he feels there's a lot of room for the general repair shop in today's service set-up.

The credit for the success of this shop, as well as for the high standard of the work turned out, goes to Warren Hartley. He has let himself be guided by what we might call the "small-shop philosophy."

What is small-shop philosophy? It's personal interest, dirty hands, and plain hard work on the part of the boss. I speak of the dirty hands because they're a badge of honor. Too few repair-shop owners know them. Hartley knows



In this instance, it is the owner's ability to take a genuine interest in customer's problems

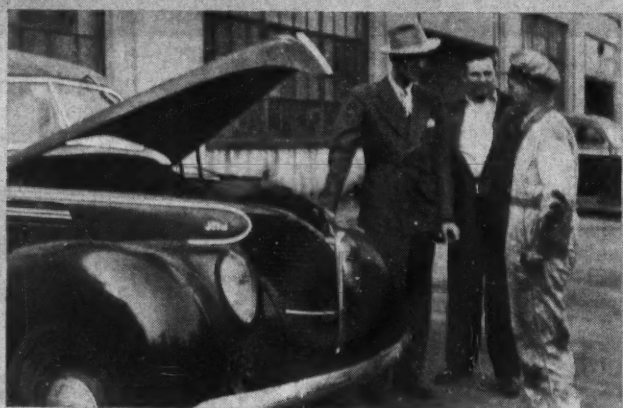
every person and every car that comes into his shop. He works on most of them himself. He talks with the people who drive in. This personal contact with the car owners is the key to his success story. This is the small-shop philosophy handed down from the days of the one-man shop. It's missing in too many shops today.

It gives the customer the feeling that Hartley is his friend and that, therefore, as a friend, he will give the car the best possible care a friend can give. People like that feeling.

Hartley knows this. He recognized it, and proved it, and he's determined to keep the trade he has won by it. He has customers today that first started coming to him when he first started repairing cars away back in 1924. He asserts that not more than one out of every 100 customers has ever left his shop disgruntled.

Because Hartley spends every working hour on the floor at all times, there's not a lot of red tape and delay between the time a customer's car is driven into the shop

(Continued on page 50)



Dealer

Mechanics

One of the Union Motor Co. mechanics writes a job ticket for the work ordered by a customer. At the left, the service manager introduces a customer to the mechanic who will be responsible for the job.



Discussing a problem of vital importance particularly to dealers, this article is only one of many in this issue of **MOTOR AGE** that make profitable reading for the car dealer and the men in his shop. All the articles in this and every other issue of **MOTOR AGE** offer helpful information on management, service, official regulations, and current developments pertaining to the automotive retail field.

A SERVICE customer of the Union Motor Co., Ford dealer at Little Rock, Ark., has driven his car to the big customers' parking area, and is now facing Carl Watson, service manager, and one of the 12 first-line mechanics.

"Mr. Smith," says Watson, "let me present Willard Colburn, who is to be your personal mechanic here. He's going to do this job for you. If you wish, you can watch him while he works. And, in the future, when you want more work done, call up and ask for Mr. Colburn. Just talk to him direct, and you'll get the best service possible."

The customer had been impressed with the personality of the mechanic even before he drove in for service. That very morning he had read a display advertisement in



A customer, wearing goggles, watches the repairs being made to his car. Though the practice is frowned upon in many shops, it is encouraged by Union Motor Co., which finds it builds confidence.

The shop porter sweeps out the trunk of a customer's car. Although manpower is not abundant, the shop finds that this is one courtesy service it can still supply. Car owners appreciate it these days.

Play Star Role

By S. W. ELLIS

the newspaper that had interested him in the service department personnel of the Union Motor Co. The heading of the ad had read:

DO YOU WANT ACTION

On the Repairs You Have Tried To Get On Your Automobile and Truck?

Then bring it to our service department and "Talk to the man who actually does the work."

All the Union Motor Co. advertising draws attention to the mechanics. The 12 first-line men and their 11 assistants are as interested in volume and profits as the owners. Having been made to feel that they are all partners in the organization, they work practically without supervision.

Because a new customer is al-

ways introduced to a mechanic and told that, henceforth, the man will give him personal service, practically all telephone calls come to the men themselves, who have been carefully coached in talking well over the telephone. The mechanics can quote prices on the jobs they handle. They also write their own tickets at the well-lighted service desk, with the customer looking on.

Since the mechanics write their own tickets and do most of the price-quoting, the need for an assistant service manager has been eliminated. Even should the service manager be absent for several days, there would be no snarls in the organization, because the me-

chanics can function without a manager when the need arises.

Records show that few errors are made by the men who write their own tickets, certainly no more than are made in a shop where the service manager or his assistant makes up the tickets. The men also keep their own work sheet efficiently. The service manager does not have to go to the shop to see what is going on, but just looks at the work sheet.

From 60 to 75 passenger cars and trucks are always in the shop for service. Most of these are serviced and returned to owners within one day. The critical ones, such as war workers' cars and essential trucks, are serviced immediately. The mechanics, having direct con-

(Continued on page 56)



Captured

DURING the past two years, you have become acquainted with American ordnance equipment. Perhaps you are less familiar with the weapons of our enemies. Our Army must have accurate knowledge of enemy weapons as technical familiarity helps to remove the mystery and prevents magnification of the power of enemy materiel.

Our studies of foreign weapons have emphasized some of the advantages which have accrued to the enemy due to the long years of engineering preparation for war which both the Germans and Japanese knew they would fight when they were ready.

The Japanese are not strong in the engineering of automotive vehicles, and, therefore, we would not expect them to produce tanks

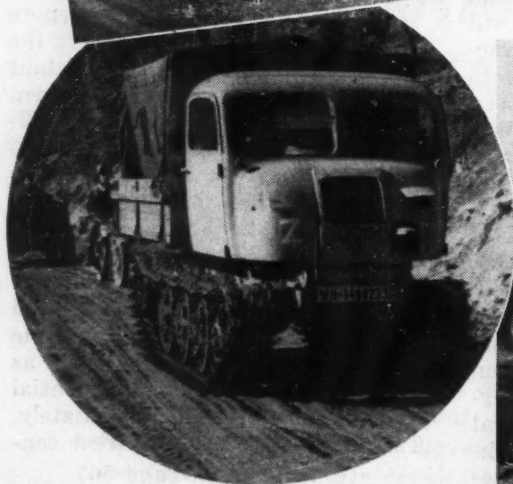


Top, left, a Jap tractor captured by the Marines on Kolombangara Island.

Left, a disabled German Mark VI Tiger tank after capture by the Allies in Italy.

Bottom, left, a German vehicle taken from Germans on drive up Italy's Adriatic coast. The cab with submerged lights and fuel tracks indicate that it is new equipment.

Below, a type of tractor developed by the Japs for the dual job of towing artillery and transporting the gun crew.



Vehicles Reveal Enemy Secrets

and armored fighting vehicles of superior quality.

Japan did not produce any tanks of her own until 1929. Her first tanks were Oriental copies of the early French Renault, British Vickers and Carden-Lloyd tanks. More recently the influence of German design can be seen. The Japanese apparently assign tanks to operations according to terrain. It is, unlikely therefore, that their heavier tanks will be seen outside China. Although the Japanese have used some 57 mm. and 75 mm. guns in their tanks, their standard tank gun appears to be the 37 mm. We do not have all models of Japanese tanks at Aberdeen Proving Grounds yet, but we are increasing the number of types.

We found a light tank, Model
(Continued on page 64)

Nazi and Jap motorized war equipment embodies ideas developed over many years of preparation for aggression, but fails to equal best U. S. design

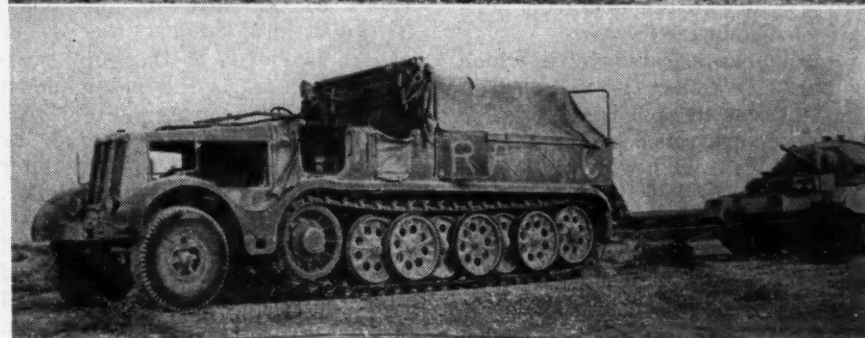
By MAJOR GENERAL G. M. BARNES

Chief, Technical Division
Ordnance Dept., U. S. Army

Right, German eight-wheeled tank destroyer, equipped with a 75 mm. cannon.

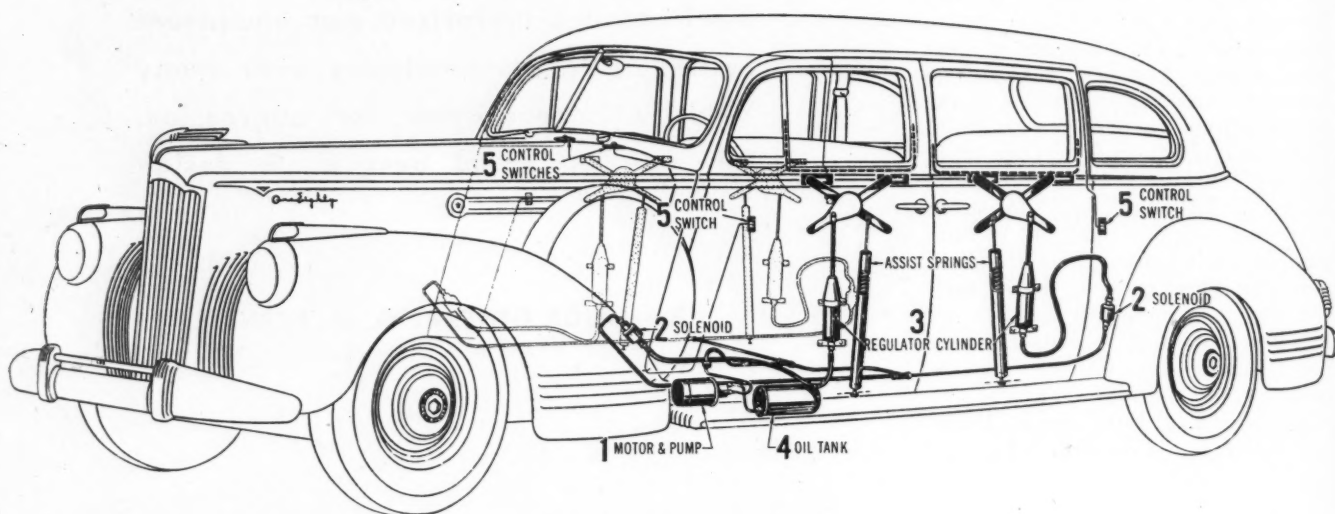
Bottom, right, German three-quarter track vehicle, designed for heavy duty.

Below, a curious vehicle used by Germans in Balkans. The wheels can be installed for operation over highways.



PACKARD

Window-Regulator



Diagrammatic view, showing the location of motor, pump, lines, and solenoids.

BEFORE attempting any service operations on the Hydro-Electric window regulators used on Packard models 1906-7-8, the units used in the system and their function should be thoroughly understood by the serviceman.

The power unit consists of a six-volt reversible motor with a built-in direct-connected gear pump. This unit circulates the fluid under pressure to the operating unit in each window.

A solenoid-operated valve, which is normally closed, is installed in the fluid line to each window. The valves are controlled by the operating switch for each window.

Inside each door is a cylinder-and-piston assembly, which is directly connected to a conventional window-regulator mechanism to raise or lower the window. The down stroke of the piston is pro-

duced by the vacuum created in the cylinder as the oil is pumped out. This motion is assisted by a tension spring.

A fluid reservoir is provided and is connected to one side of the pump to hold the fluid pumped out of the actuating cylinders as the windows are lowered.

Double-acting control switches are provided for each opening, located conveniently in the body. To raise any window, the proper switch is moved to the "up" position. This starts the motor and at the same time opens the solenoid valve in the line to that particular window, allowing oil to flow under pressure to the operating cylinder. When the window is in the raised position, it is held there by the oil held in the cylinder by the closed solenoid valve. When the control is moved to the "down" position,

the motor starts in the reverse direction and the solenoid valve opens, allowing the cylinder to be emptied of fluid, creating a vacuum in the cylinder and thus lowering the window.

The battery-connection circuit is provided with two solenoid-operated switches, one for each pair of field windings in the motor, and also with a relay to prevent the closing of both switches at the same time. The relay is connected to give control to the wiring which lowers the window, so that, if one operating switch is held in the "down" position and at the same time some other switch is moved to the "up" position, both windows will open. Two or more windows may be operated at the same time in the same direction, but not in opposite directions. Under all conditions, the downward movement of

Service

Unique system of hydraulic control raises new repair problems that can be readily solved by following the procedure outlined in this article

the window will predominate.

The motor itself requires no attention other than lubrication of the armature bearing, at the brush end, with a few drops of light engine oil every 3,000 miles. The bearing at the pump end of the motor is lubricated by fluid from the pump.

The fluid pump is a regular gear-type in a die-cast housing which forms the end plate of the motor as well as the gear housing. A maximum-pressure-regulating valve, which is non-adjustable, is built into the pump housing and is fitted with a dash pot to prevent chatter. This valve by-passes the fluid when the window reaches its upper limit or if it should strike an obstruction. The regulating-valve spring is set in assembly for the correct pressure and, under no circumstances, should it be stretched or otherwise altered. Pressure delivered by the pump should be 120 to 130 lb. when the battery is in a normal state of charge. In the reverse direction, the pump should produce a vacuum of 15 to 18 in. of mercury. A combination pressure and vacuum gage must be used to check the pump. A gage showing pressure or vacuum only must not be used, as serious damage to the gage will result.

Each end of the pump gears is fitted with a hardened and ground

thrust plate. Due to the very close clearances required in the pump to maintain proper pressure, these plates or the gears must not be interchanged with other pump housings. If it is necessary to disassemble the pump for any reason, the gasket surfaces must be scraped clean and new gaskets of the correct thickness used when reassembling the unit. Gaskets of incorrect thickness will cause either binding of the gears in the housing or loss of pressure.

The solenoid control valves are sealed units and must be replaced as a unit in the event of trouble or failure. The clamp which holds the solenoid valve to its mounting also serves as the ground side of the electrical circuit. This clamp must be clean and tight. When a hose or tubing connection is to be removed or replaced, a wrench must be used at the end of the solenoid at which the connection is to be made. Holding the solenoid in the center or the opposite end will result in internal damage, necessitating replacement of the unit. When installing the valve in the line, be sure it is positioned correctly so that pressure from the cylinder and piston will hold the valve on its seat.

The hydraulic operating piston and cylinder in each door is pro-

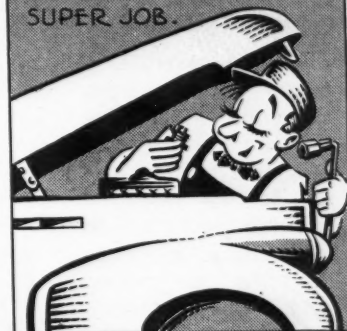
(Continued on page 74)

BUTCH . .

BUTCH / DOC JONES WANTS HIS PLUGS CLEANED AND SET. IF YOU CAN'T FIND A .025 FEELER GAGE USE A DIME.



DOC HASN'T BEEN ANY TOO FRIENDLY LATELY - GUESS I BETTER DO A SUPER JOB.



DOC'S CAR WON'T EVEN START / DID YOU USE A DIME LIKE I TOLD YOU ?



I DIDN'T HAVE A DIME, SO I USED TWO NICKLES!



DID YOU Know It?

WHO?

WHAT?

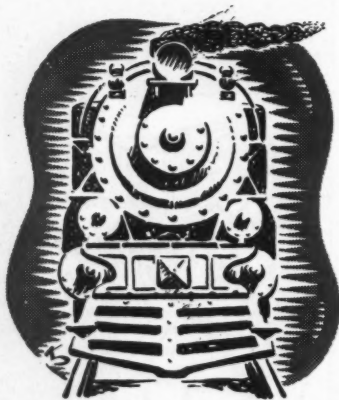
WHEN?

WHERE?

WHY?

... and HOW?

Railroading at Rouge



Although it is one of the largest producers of trucks, the Ford Motor Co. operates its own railroad. The huge Rouge plant near Detroit has a system comprising 100 miles of track and 21 locomotives to keep the average of 518 freight cars a day moving into and out of the plant. This is little more than half of the

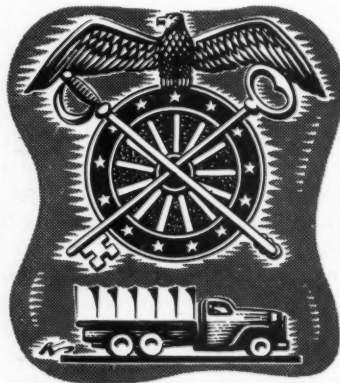
1941 average, however, when 1,095 freight cars daily were checked in or out of the Rouge. The number has declined greatly since the war because most war products made there are smaller and more compact than bulky automobiles. Ford's larger war items, such as bombers and tanks, have been shipped from Willow Run and Highland Park, respectively.

The Ford railroad has a working force of 400 men, including 48 conductors and 61 engineers. Eleven of the plant's 21 locomotives are steam-driven and 10 are of the Diesel-electric type. Locomotives are repaired and sometimes rebuilt at the plant. The railroad's own rolling stock, which operates over the Rouge plant's 1,200 acres, includes 676 steel hopper cars, 67 dump cars, 233 gondolas, 16 flat cars and 15 tanks.

During a recent fire which burned a section of the

aircraft engine building, the members of one Ford train crew were acclaimed for their heroism in pulling out of the building a flaming freight car loaded with magnesium machine scrap which had spontaneously ignited. At much personal risk, they also uncoupled another car filled with 2,000-hp. aircraft engines and hauled it to safety.—Ed Warner.

Limited Heroes



One of the strangest jobs to fall to an automobile man in the war is that being carried through successfully by Maj. James B. Sampson. Before the war the major was plain Jim Sampson, known widely among automobile men in Texas as a manufacturer's agent, who piloted his own plane.

Last summer Major Sampson, a flier in the first World War, was assigned to the organization of a provisional unit, a Quartermaster Truck Battalion, consisting entirely of limited service personnel. Twenty-eight per cent of the unit, which is now overseas, is made up of men who have seen front-line service in the Mediterranean theater, six of them holding the Silver Star, and one of these six proudly wearing the Distinguished Service Cross.

LET US SEND YOU \$10.00

Motor Age will pay \$10.00 each for acceptable short items or articles which are published in this department. They should be brief, preferably with a real humorous touch and, above all, should be of wide interest to those in the trade. They can be anecdotes regarding well-known men in the automotive industry, interesting bits about little known facts relating to the industry or its products, stories about unusual stunts or experiences with automobiles from the earliest day to the present. The general character of the material desired may be judged best by referring to the items on these pages and in this department in previous issues. The facts should be simply but plainly stated without any attempt, necessarily, to put them in publishable form. The Editors will see to that.

Send your contribution—every reader of Motor Age is invited to do so—to "Did You Know It", Motor Age, Chestnut and 56th Sts., Philadelphia 39, Pa.

Despite the handicaps that keep these men from participating in the actual fighting, they are hanging up records for transportation of vitally needed war material, and have won commendations from a higher headquarters. Some of the credit at least for the battalion's enviable showing must go to Major Sampson's knowledge of men and, perhaps, to the sign to be seen behind his desk:

"Give me a reason why it can be done, not a reason why it can't be done."

Noisy Success



Stories of inventors who failed are common enough, but instances in which the inventor succeeded too well are rarities.

When Miller Reese Hutchison was working on the development of the Klaxon horn more than 35 years ago, his aim was to produce a signaling device for automobiles that

would outdo any known instrument in creating a racket. The bell, the horn, and even the siren had already been adapted to automobiles, but each type had its limitations and Hutchison started to work along different lines.

After discarding the buzzer-type electric horn as unsatisfactory, he tried a horn with a larger diaphragm. He placed a button of hardened steel in the middle of the diaphragm and then placed a lobed wheel, driven by a flexible shaft, in contact with the button.

When power was applied to the wheel, the resultant noise would have made a banshee sound like a crooner. It almost split the ear drums and frayed the nerves of everyone within a city block. It would have saved a pedestrian from being run down by scaring him to death, and the driver along with him.

Hutchison, discouraged by his success, then turned to a milder method of flexing a metal diaphragm by means of a toothed wheel, keyed directly to the shaft of an electric motor. The result was the Klaxon, the penetrating yet not disagreeable sound of which was familiar for so many years.—J. E. Ford.

Fast Starter



Vincent Bendix, aside from the vastness of his enterprises, is known chiefly as an inventor. The fact that he made one of the most momentous sales in automotive history in what is perhaps record time is almost forgotten.

In 1913, while the motor-cycle show was being held at Chicago, Bendix

walked into the booth of the Eclipse Machine Co. and showed a new device to E. J. Dunn. The device was a new starter for automobiles. Before Bendix left the booth a few minutes later, he had closed a deal with Eclipse, giving the latter exclusive rights to manufacture the starter.

From that quick deal grew the tremendous business which is the cornerstone of the Bendix Aviation Corp. of today. Millions of American cars built every year before the war and most of those built abroad were equipped with Bendix starters.

Who Is This Man?

He was born at Geneva, Ohio.

He built a steam car before he produced his first gasoline automobile and organized his own company in 1897, selling six cars the first year.

Subsequently, he gave his name to another passenger car and a truck.

One of his early cars is exhibited in the Smithsonian Institution, Washington, D. C.

He invented a power lawnmower.

He is now retired and resides at Daytona Beach, Fla.

If these hints do not stimulate your memory sufficiently to identify him, turn to Page 50 for the answer.



PARTS TOOLS EQUIPMENT ACCESSORIES

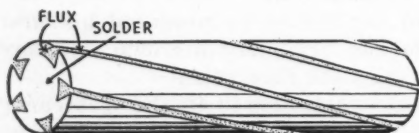
Safety Goggle

Just announced by Willson Products, Inc., of Reading, Pa., is the Willson MonoGoggle, designed to provide high impact strength, unobstructed vision and the highest degree of comfort. Weighing only 1¼ oz., this new streamline goggle has a replaceable, non-shatterable, crystal-clear plastic lens, and can be worn comfortably over any prescription glasses.

Fluxed Solder

A new type of fluxed wire solder, which contains flux in longitudinal grooves on the surface rather than in the conventional core, has just been placed on the market.

The new material, called Fluxrite and put out by National Lead Company, 111 Broadway, N. Y., is said to



NEW TYPE OF WIRE SOLDER WITH FLUX IN GROOVES

overcome completely an inherent disadvantage of regular cored solders which supply flux and solder to the surface simultaneously. Since the flux in the new product is outside rather than inside, it liquefies and flows onto

the work before the solder melts. This insures thorough and complete fluxing and results in stronger and better solder joints.

The new product, which contains a recently developed special flux, comes in the same diameters as regular cored solder. It is available in two compositions designated as Red Stripe and Green Stripe. These designations refer to the color of the flux, which has been specially dyed in each case for easy identification.

Grease Remover

The problem of finding a clean, convenient, effective, and sanitary way of removing oil and grease from the hands and arms is said to be satisfactorily solved by a product called "Flix", developed by Waverly Petroleum Co., of Philadelphia, Pa.; and Refiners Lubricating Co., of New York, N. Y.

Flix is a hand-sized, semi-quilted pad, containing a remarkably effective absorbent substance that quickly removes all types of oils from the skin, leaving it clean and dry.

The manufacturers claim many advantages for it, saying that it helps prevent skin diseases, is economical, safe (due to the fact that it will not burn and has no loose ends to catch in machinery), is sanitary, is useful in removing oil from machine parts

preparatory to painting, speeds cleaning and saves soap.

Descriptive literature, or a free sample and demonstration are available upon request.

Molded Lining

Improved molded brake lining, with wire back reinforcement, for use with external (band or contracting type)



brakes is announced by the Gatke Corp., 228 N. La Salle St., Chicago 1, Ill.

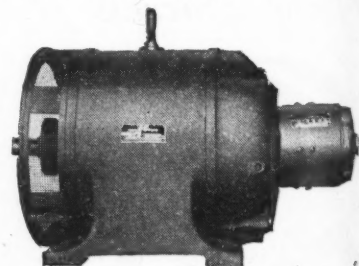
Known as Gatke External Dura-Blok Brake Lining, this latest Gatke development is being used on many applications to replace woven brake lining, which is critically scarce due to war-production requirements for prodigious quantities of woven asbestos materials.

Rolls of Gatke External Dura-Blok are furnished in a complete range of sizes up to ¾ in. thick by 6 in. wide.

Generator

Century alternating current generators are available in sizes ½ to 150 K.V.A. for direct connection or belted drives.

This unit has a revolving field generator, arranged to bolt directly to the engine housing, with the generator shaft machined to receive a flange that bolts directly to the engine shaft. This generator has one bearing, with



the engine end of the shaft supported by the engine bearing. The exciter is mounted on the end of the generator opposite the engine. The exciter shaft is inserted in and keyed to the generator shaft on the inner end, and the generator bearing carries the exciter. The exciter has one bearing at the outer end. The generator and the exciter are arranged to use the least space and, together with the engine form a compact power unit. Century Electric Co., 1806 Pine St., St. Louis Mo.

Laughs OF THE MONTH



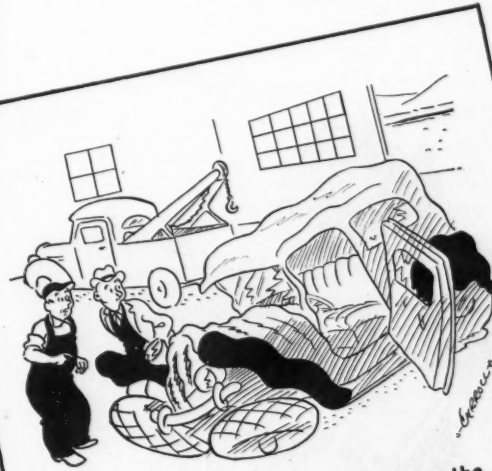
"Hugo, do you suppose that in between watching girls pass by and working on your own jalopy you could squeeze in a little work on a customer's car?"



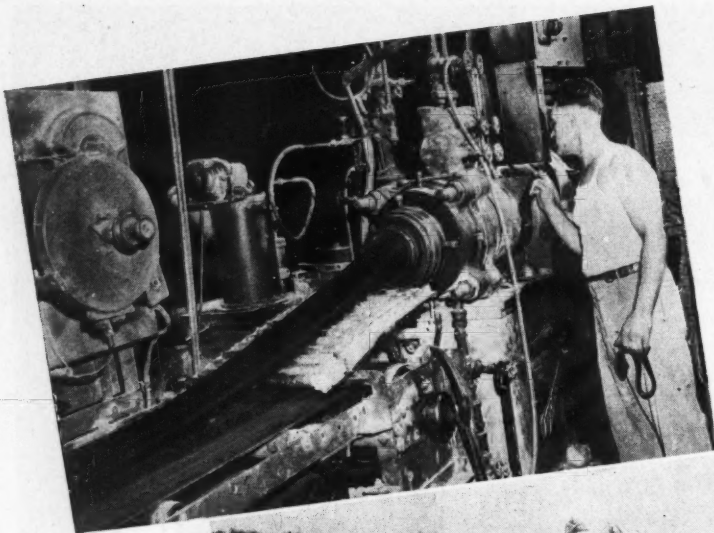
"I'll run out and examine your car next week, Doc. In the meantime you might bring in a sample of the radiator water."



"Psst, Buddy . . . wanna buy a car?"



"I wanted to take it straight to the graveyard but the owner insisted on a funeral service first!"



TEST-TUBE TUBES. Containing no crude rubber whatever, the inner tubes being extruded at a B. F. Goodrich factory are made of synthetic. Tubes so made are black.

ARMORED SCOUT. The Army's new M-8 combat reconnaissance car is a 6 by 6 job, carrying a 37 mm. cannon and a .30 caliber machine gun. Its top speed is not revealed.



JEEPERS. If a four-man Army car is a jeep, this Coast Guard version must certainly be a jeep, since it carries 10. It's used on sandy beaches by the shore patrol.

Crude Rubber Content of Truck Tires Lower

STANDARD sizes of truck tires now contain a much smaller proportion of crude rubber than previously. The reduction, announced March 28, amounts to approximately 35 per cent.

Two of the major types of truck tires affected are the 8.25-20, 10-ply standard highway tires, and the 11-22, 12-ply standard highway tires. Similar conversions are being made in the manufacture of sizes intermediate between the two.

The directive, issued by Office of the Rubber Director, permits truck tires to be made in two ways, either with 100 per cent synthetic tread applied to a 100 per cent crude carcass, or with the permitted amount of crude distributed anywhere in the tire.

Synthetic Camelback for Passenger Cars

GRADES A and C synthetic-rubber camelback may be used for retreading automobile tires without restrictions, beginning May 1, according to a directive issued by Rubber Director Bradley Dewey.

Both grades are superior to Grade F, containing only reclaimed rubber, which has been the only type of

HANGOVER. Two occupants of this car were removed safely as it hung perilously over a Los Angeles, Cal., bridge 50 feet above ground. They suffered no injuries.





WASHINGTON

RULINGS AND REGULATIONS



camelback available for passenger-car tires for the last three months. Grade A is top quality, containing only Buna S. Grade C is medium quality, 25 per cent reclaim being permissible.

Factory-Second Tires for "B" Gas Book Holders

FACTORY seconds of synthetic-rubber passenger-car tires have been made available by the OPA to car owners now eligible for used Grade III tires. These are the holders of "B" gasoline ration books. Factory-second tubes of synthetic rubber are now ration-free.

The OPA estimates that about 50,000 factory-second tires were being held by factories on April 1. Previously they had been available only to car owners already eligible for first-grade tires, but holders of certificates for the better tires refused to accept seconds.

The OPA announced at the same time that regulations authorizing increased inventories of new tires and tubes for exclusively wholesale tire dealers would be revoked.

New Maximum Prices Higher on Used Parts

HIGHER prices for most used automobile parts are permitted by the amendment announced last month

to Maximum Price Regulation 453. Under the amendment, the ceiling price of parts sold at wholesale or retail is 75 per cent of the manufacturer's suggested retail list price, if the parts are usable without being rebuilt. If rebuilding is necessary, the ceiling price must not exceed 30 per cent of the manufacturer's suggested retail list. Previously the prices were frozen at the seller's highest March, 1942, price.

Sellers who included taxes in their selling price in March, 1942, may now add these taxes, if they are not already included in the resale price.

The amendment further permits sellers to add an allowance to the maximum selling price, instead of the

actual amount of the manufacturer's federal excise tax. This is limited to 3 per cent, and is not to be considered as the exact amount of the tax. It is to be designed on reseller's invoices as "special handling charge authorized by OPA."

Periodic Tire Inspections for Passenger Cars End

ONE of the more irksome inconveniences of the war period was eliminated April 20 when the OPA announced the end of the periodic tire inspections for passenger cars. The reason given by the OPA was not the

(Continued on page 40)



PRETTY SOFT. But this Marine truck driver at Cape Gloucester on New Britain island wishes the ground were a little firmer. Mud was more trouble than Japs at first.



RECORD TALK. Lester B. Cassiday, right, is presented with a recording of his soldier son's transatlantic talk with movie stars on one of Electric Auto-Lite's radio shows.





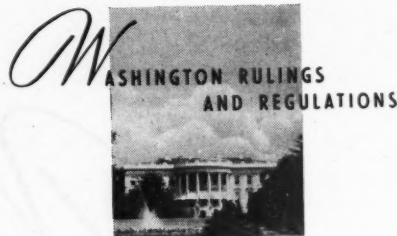
WPB SAYS "NO." Lawrence W. Zonker, for whom a bench warrant was issued at Los Angeles, charging him with selling butane equipment to motorists without priorities. Motorists used butane in their cars.



BOSSES ODT. J. Monroe Johnson, member of the Interstate Commerce Commission, who was named last month to head ODT, replacing the late Joseph B. Eastman.



COOLS HOT JOBS. New fan, shown here on a Wright Cyclone engine, is said to improve climb, cruising speed, and altitude performance of fast U. S. fighting planes.



present critical tire situation but the fact that the public had been made tire-conscious, making it possible now to relieve them of the effort and expense of having their tires examined at regular intervals.

Tire-inspection records must be retained by owners, since these will be used by the OPA in the gas-rationing program. As before, an authorized tire inspector must examine a tire before local War Price and Rationing Boards will issue a certificate for a replacement tire.

Truck tires are not affected by the order. They must be inspected as formerly.

Brake Advisory Group Is Appointed by WPB

A BRAKE Industry Advisory Committee has been formed by the WPB. Members of the committee are:

A. Vance Howe, Bendix-Westinghouse Automotive Air Brake Co., Elyria, Ohio; E. E. May, Bendix Products Division, Bendix Aviation Corp., South Bend, Ind.; J. R. Rose, Wagner Electric Corp.; St. Louis, Mo.; Charles F. Smith, The Midland Steel Products Co., Cleveland, Ohio; Paul H. Werres, Warner Electric Brake Mfg. Co., Beloit, Wis.; and J. H. Weyer, Moraine Products Division, General Motors Corp., Dayton, Ohio. F. E. Evans, of the Automotive Division, WPB, was appointed government presiding officer.

The first meeting of the committee was held April 4.

Boost in Passenger-Car Tire Chain Production

AN increase in the production of tire chain for passenger cars was authorized April 3 by the OPA. Most manufacturers may now use 24 per cent of the total weight of metals he used in the production of all tire chain sold by him during the base period from April 1, 1941, to March 31, 1942. The production rate is authorized until March 31, 1945. Previously the percentage was 16 per cent.

The increase permitted in the production of complete chains for passenger cars may be higher, since the original order limited the amount of

metal that could be used to one-fourth of the total permissible. The amended order places no limitation on the quantity of metal that may be used for complete passenger-car chains so long as the total does not exceed the limit of 24 per cent of all metal used for chains in the base period.

Another provision of the amendment may prevent any increase of production by manufacturers within Class I and II labor-shortage areas. Manufacturers in such areas may not use a greater tonnage for tire-chain production than they used last year, unless a specific authorization is obtained from the WPB.

The amended order also provides that a producer of farm-tractor tire chain may use in the year that began April 1 the amount used for such chain sold by him either during the year April 1, 1940 to March 31, 1941, or the year April 1, 1941 to March 31, 1942, whichever is greater.

The 6.00-16 tire size has been added to the sizes permitted for commercial vehicles.

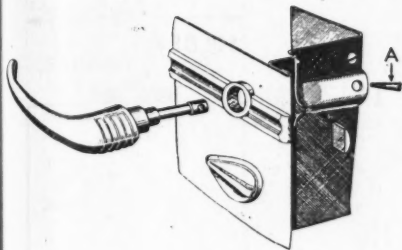
New Synthetic-Rubber Tire Ceilings Imposed

CEILING prices for tires and tubes of synthetic rubber have been established by the OPA.

At retail, the ceilings for passenger-car tires are approximately 9 per cent above November, 1941, list prices on natural-rubber tires of the grade known as manufacturers' 100 level brands. However, prices are about 6 per cent under the temporary ceilings used since the production of synthetic tires began. Virtually no change is made in the prices of synthetic-rubber tubes and truck tires. The margin provided on all synthetic trucks and tires gives retailers at least as much gross profits as they received on these items in the past.

In general, the new ceilings decrease the price for manufacturers' brands of synthetic passenger-car tires and increases those for private brands. A 6.00-16 tire now has a ceiling price of \$16.05 regardless of brand. Under previous temporary ceilings, the same tire cost \$17.11 for manufacturers' brands and \$15.37 for private brands.

Natural-rubber tires and tubes, of
(Continued on page 89)



Outside Door Handles

To remove Pontiac outside door handles, remove the retainer screw "A" through hole in face of door lock pillar and pull out handle.

Setting Door Locks

All 1942 four-door Chevrolet door locks can be changed for positive action or free wheeling.

To change to free-wheeling, thrust a pointed tool, as shown in illustration, through the clearance hole in the face of the lock pillar, engage the tab on the remote control link lever and trip the lever to the "up" position to engage the intermittent lever. To set for positive action on the handle, reverse this procedure, tripping the lever downward to engage the lock bolt.

Identifying Models

The following methods can be used to determine readily whether a 1942 Studebaker President transmission is the free wheeling and overdrive type or has the governor controlled transmission:

Turn on the ignition switch and depress the accelerator all the way to the floor board. With the free wheeling and overdrive transmission, there will be a distinct click audible when the accelerator is depressed. This click is caused by the contact made through the over-drive cut-out switch at the carburetor.

With the governor-controlled transmission, there will be no audible click as there is no electrical contact when the car is at a standstill.

Identification of the governor-controlled overdrive transmission can also be made by an inspection of the transmission from underneath the car.

The type of transmission can be determined also by raising the hood and inspecting the kick-down control switch. The switch used with the governor-controlled transmission has four connecting wires, while the free-wheeling and overdrive transmission kick-down switch has a single wire connection.

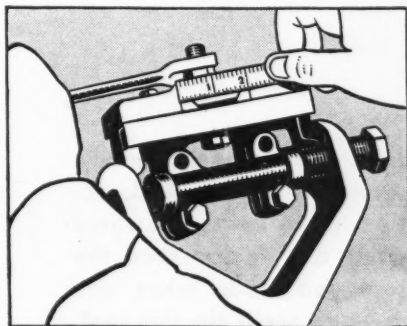
Upper Control Arm Bushings

It is recommended in the event of damage to the upper support arm, or pivot bar, on a Plymouth that a complete upper support arm assembly be

SERVICE HINTS



FROM THE FACTORIES



installed. However, if necessary, a new support-arm pivot bar or bushings can be installed as follows:

The upper control-arm pivot bushings are the self-threading type. When installing a new upper control arm pivot bar, use new pivot-bar bushings.

When assembling the upper control arm, pivot bar and bushings, a special spreader must be used to maintain the proper spread of the control arm and to relieve the tension on the threads of the pivot bar after the bushings have been properly installed.

Insert the pivot bar in the control arm and install spreader tool on the pivot bar, using two cap screws and nuts through two holes provided in the tool, and two of the pivot bar hold-down bolt holes.

Spread the control arms 1/16 in. from its original "at rest" position.

Start the bushings on both ends of the pivot bar. Lubricate them with a suitable lubricant such as tapping compound. This will allow the bushings to cut their own thread in the control arm without scoring. Thread the bushings into the control arm until the shoulders of the bushings contact the surfaces of the control arm. Tighten with a torque of 110 to 140 ft.-lb. This is equivalent to a

load of 55 to 70 lb. on a 24 in. lever.

Remove the spreader. Check the operation of the pivot bar for free movement in the bushing. Only a moderate grip on the pivot bar should be required to turn it. The pivot bar should not be rotated as this will throw the pivot bar off center with the control arm.

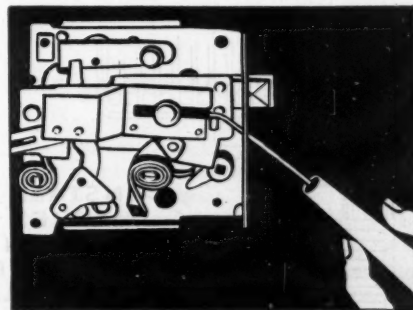
Lubricate the control arm bushings with semi-fluid chassis lubricant before installing on car.

Pontiac Door Lock

On the 1942 Pontiacs, the remote-control link is attached directly to the lock bolt on all doors. This remote-control mechanism, attached to the door inner panel, is adjustable fore and aft to take up end-play in the link. This adjustment also shortens or lengthens the travel of the lock bolt.

To adjust, remove the door trim pad down the lock pillar and hinge pillar far enough to loosen the three bolts in the remote control mechanism. Adjust by moving forward and back to take out play in the link.

When making these adjustments, be sure the lock bolt has no restriction, as this will prevent locking the door with the inside door lock.

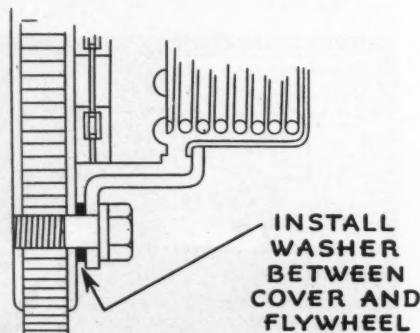




Here's your chance to pick up a little cigaret money. We'll pay five bucks (\$5.00) for every Shop Kink accepted and printed. So send 'em in to us—some short cut you use in doing a job easier and faster than the other fellow—some special tool you made when you couldn't buy one to do the job—and we'll do the rest. Incidentally we won't accept any that have previously appeared in any other automotive publication. Here are some that were accepted this month.

Curing Clutch Drag

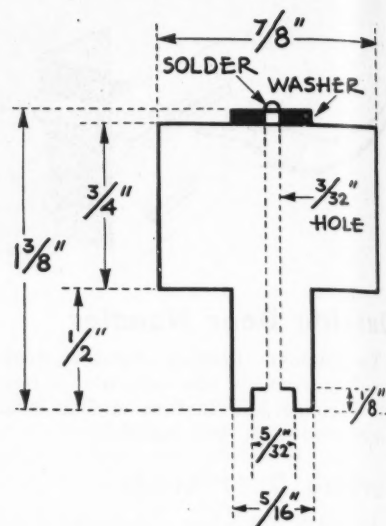
If a clutch drags or won't disengage after installing a new disc and the adjustment is not sufficient to take care of it, I place flat washers of even



thickness between the pressure plate and the flywheel at the bolts' holes which hold the pressure plate to the flywheel. I remove the washers after the clutch disc has worn sufficiently to permit it.—*L. D. Hadley, Box 225, Coldwater, Kans.*

Saving Horn Wire

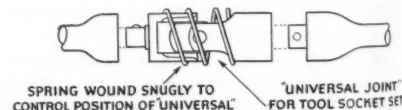
We have had a number of cases of horn wires breaking on 1941 Fords. Some of these cars break as many as two a month. We have used the most flexible wire we can obtain but with no success. The original wire is attached to the button with a screw and must twist back and forth with the steering wheel. The twisting action causes the wire to break.



To overcome this condition, we make a bushing as shown in the sketch. This bushing allows the wire to remain free. We leave the small bolt in the top of the button and space it with washers as needed. It is not necessary to hold the bushing down with the spring, as the locking part of the button is insulated from the button itself. If the wire or bushing works up to the button, it cannot blow the horn unless the button is depressed.—*Joe Kopski, 444 Centre St., Freeland, Pa.*

Emergency Wrench Repair

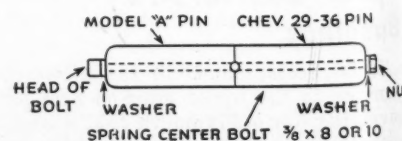
When the universal joint in a socket set becomes worn and loose, it is very annoying to have it wobble all over when attempting to place the socket on a nut. To overcome this, I wind a small compression spring around the joint, bending the ends into the slot in the joint as shown in the sketch.—*I. D. Swan, 1003 Ferguson, Springfield, Mo.*

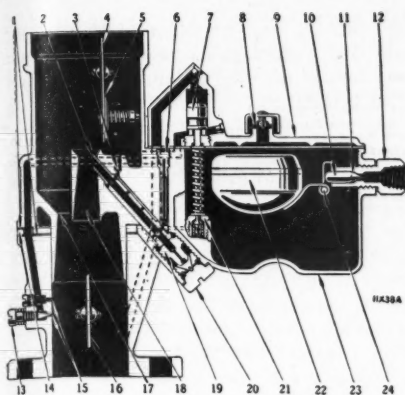


Inserting Piston Pins

When installing piston pins in Ford Model "A" pistons, I use a tool which I made for the purpose.

I took a 1936 Chevrolet piston pin and ground one end to a taper. Then I bolted the Model A pin and the Chevrolet pin together. The Chevrolet pin is started through the pin bosses first and will spring the lock ring in the rod sufficiently to allow the Model "A" pin to go through the rod.—*John W. Scherer, 1027 Hammond Ave., San Antonio 3, Tex.*





THE READERS'

CLEARING HOUSE

of Servicemen's Queries

Carburetor Floods

We have a customer with a 1937 Dodge that has a flooding condition between 15 and 20 m.p.h.

We have removed the carburetor, cleaned it out thoroughly, and adjusted the float level to $\frac{5}{8}$ in., removed the distributor and cleaned it out, installed new plate, points and condenser, new plugs set to .037 in., and a new coil.

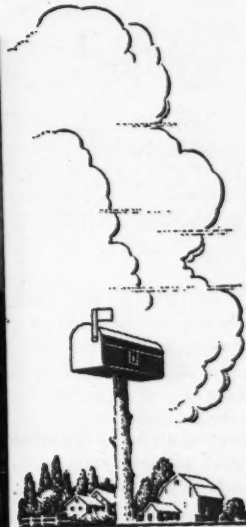
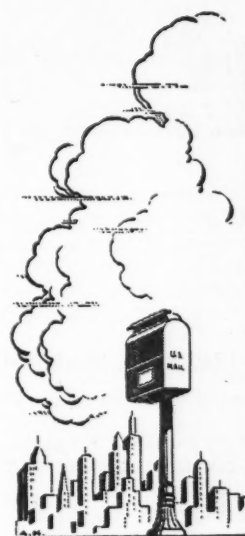
Vacuum is 19 in., mileage around 19 miles a gallon. The car has good speed and power. We have no manifold leaks, because the engine idles perfectly, but at 15 to 20 m.p.h. it acts as if the choke were on a little, to give it a rolling action. The automatic choke is in good condition.—A Wisconsin Subscriber.

THIS condition indicates to me that the spring on the economizer by-pass valve, which is the little valve located in the bottom of the accelerating pump well, is weak. If this spring is weak, it allows the by-pass valve to remain partly open and, of course, the mixture will run rich. My suggestion is that you replace this economizer by-pass valve with a new one, as I believe this will overcome your trouble.

Stubborn Miss

I have a customer with a 1940 Chevrolet that fires across the spark-plug porcelains, causing most of the plugs to do the same. This happens mostly when turning a corner, more so if you are going up grade after making the turn, and also on any hard pull, and on a sudden hard throttle. The miss is always across the spark plugs from the wire terminals to ground.

Since this trouble developed, the engine had a complete overhaul (the overhaul was done to overcome high oil consumption). Before and after the overhaul the trouble was the same. Two makes of plugs were installed, ignition thoroughly analyzed, and new points installed. Coil was checked and found O.K., but another tied in for test. Another make of carburetor designed for Chevrolet, was installed for trial. Heat mani-



Bill Toboldt, Editor, Motor Age

fold valve was working O.K. Different brands of gas have been tried, allowing plenty of time to be sure they did not mix in the gas tank. The battery is almost new. The plug wires were replaced recently. In fact, so much has been renewed or tied in I am completely lost as to where to look for the trouble. This miss will soon have the gears torn out if it is not soon found.

This car hauls a load of machine-shop operators every day to Waynesboro, Pa., on defense work, so it is up to me to keep it going. Any suggestions you can make will be greatly appreciated.—C. E. Ross, Hagerstown, Md.

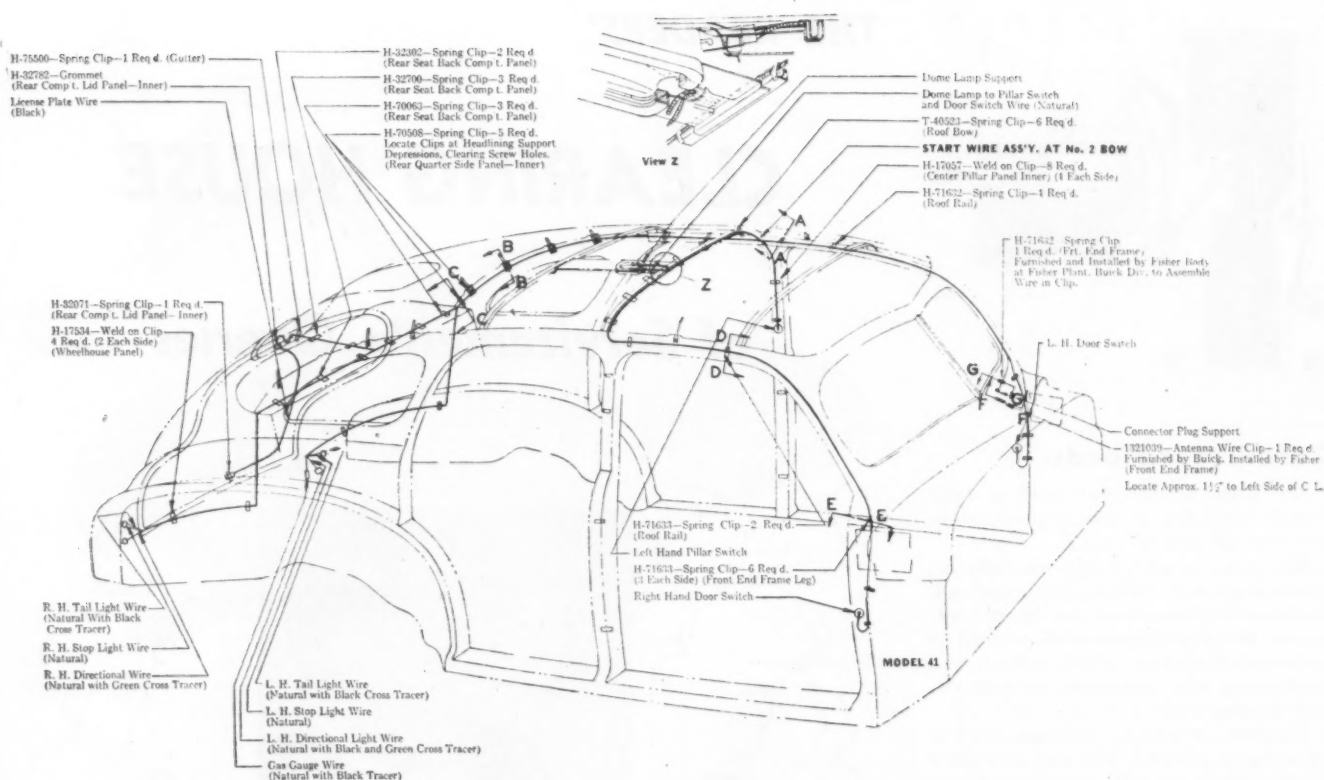
ON the trouble you are experiencing with spark plugs on the 1940 Chevrolet, you can overcome this difficulty by installing insulating skirts over the spark-plug porcelains. You can also try operating

the car with a slightly smaller plug gap. Though factory specifications call for .040 in., you might try setting them at .035 in. You might also check with your local jobber to make sure you are using the latest type of plug recommended for this car, as there have been several changes since this car left the production lines.

Since you state that the spark jumps from the wire terminals to the ground, I would check these terminals to see that they are not too close to any part of the head or block.

Boring Bar Technique

I have been a mechanic for a good many years and am now working on war work. We have a new boring bar, also a piston grinder. I have never had occasion to use either of these until now, as we always farmed this kind of work out. The engines are 5.5 in. or larger bore; pistons,



Body Diring Diagram, 1942 Buick, Model 141

semi-finished aluminum; engines L-head; blocks are cast, with three cylinders in each.

Do you think it safe enough to cover the crankshaft, etc., the same as on cars and rebore, when it is not necessary to remove blocks for other repairs? We used to put the cars on wash rack and wash them out with air and kerosene, but this equipment is too big to move around once a job is torn down and it is a messy job, otherwise. Do you think it would be better and faster, if I were going to fit only one or two .005 or .008 over-size pistons 5.5 in. bore, to use the boring bar? Someone suggested I use a hone.

Should it take very long to learn to use the boring bar, and can you give me the information? How about cam grinding the pistons? Would it be better to use a dial gage and outside micrometers, or inside and outside micrometers?

I would appreciate it very much if you can supply me with this information or if you can tell me where I could get it.—E.M.R., An Ohio Subscriber.

THE question of refinishing cylinders is quite a controversial one, some mechanics holding that a boring bar is best and others believe in a hone. A third group which incidentally is largest, believes that a boring bar be used first and then the job finished with a very fine hone.

On these 5½-in. bore engines on which you are working, I think you

can rebore them in position provided you take every precaution to keep the chips from entering the crankcase. In addition to covering the crankshaft and camshaft, you should also cover the cylinders which are not being worked on.

For complete information on how to use your boring bar, I would suggest that you write direct to the manufacturer. I am quite sure you will have no difficulty in becoming proficient in using the boring bar if you follow the maker's instructions. At the same time I would ask for instructions on how to use the piston grinder.

I think that, in general, you will find the use of a dial gage and outside micrometers easier than an inside and an outside micrometer. In general, it is rather difficult to become proficient in the use of an inside micrometer.

Crankcase Dilution

I have a customer with a 1940 Hudson 6 Model 41 who has trouble with gas leaking into crankcase. In 30 miles of driving, this car will gain 3 qt. of extra oil in case. He drives a distance of $\frac{3}{4}$ mile four times a day.

This motor has been tuned, the carburetor float adjusted, two rebuilt fuel pumps installed, automatic choke removed, and manual choke installed, but it continues to gain oil at the same rate. Car starts and runs perfectly and has lots of power. Has some trouble fouling plugs but a hotter set cured that.

I would appreciate any help you can give me on this one. Owner has sent carburetor to specialist to be overhauled but I do not believe this will help any and would like to be prepared to remedy trouble if it does not.—Julius Martini, 163 Pine St., Kingston, N. Y.

I AM quite sure the difficulty you are experiencing on the 1940 Hudson results from the type of driving. In other words, the short trip of $\frac{3}{4}$ mile is not sufficient to get the engine warm, with the result that there is considerable condensation of moisture in the crankcase and gasoline from excessive choking. This is a very difficult situation to overcome in the winter months. The main thing to do is to get the engine to operating temperature as quickly as possible.

First of all, you have to make sure that the thermostats are operating correctly. In general, most cars are fitted at the factory with thermostats opening at 145 deg. I would suggest that you install new ones opening at a higher temperature of approximately 180 deg. I would suggest that you also place a card or a similar device in front of the radiator core to reduce the passage of air.

Several years ago, it was possible to buy special covers for the oil pan so that they would retain the heat. I understand that these are no longer available, but you might try painting the exterior of the oil pan with a thick asphaltum paint so as to prevent some heat from escaping.

I would suggest that you carefully

instruct the owner on how to use the manual choke and emphasize the importance of using it as little as possible.

Starter Gear Rusts

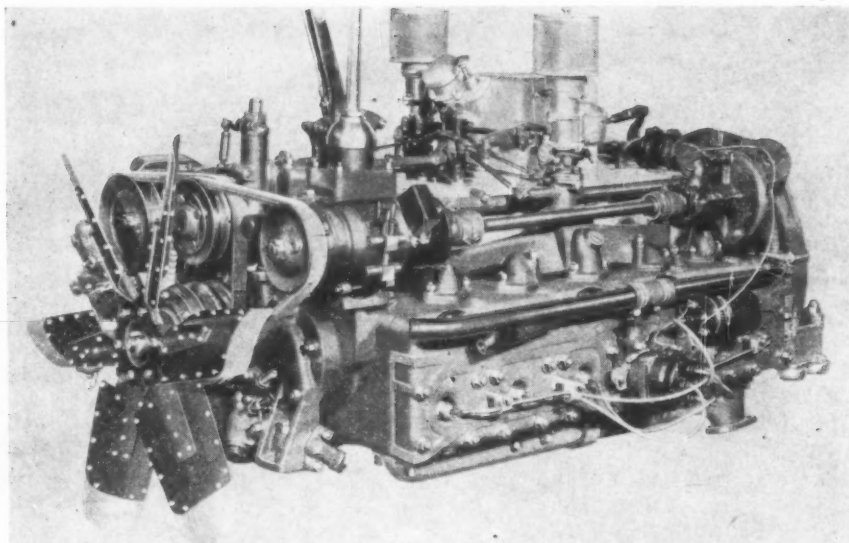
We have in the shop a 1937 V-8, half-ton pick-up Ford on which we recently replaced flywheel gear, and completely rebuilt the clutch, including new lining on disc plate. Now, about every 10 days, it is necessary to remove starter, clean rust from Bendix gear worm, so gear will make contact with flywheel gear. Moisture collects on Bendix gear, causing rust.

Truck is used about once a week to haul one ton of sacked grain a distance of 30 miles, and every day for light short-haul deliveries. I do not know the brand or make of transmission oil used.

Water consumption about 1 qt. a week. Engine runs very cool. Car stands in private garage on a dry, cement floor. I would appreciate any suggestions which may be used to overcome this trouble.—Bertram Foster, Vista Lane, San Ysidro, Cal.

It is rather difficult to say just what might be the cause of the rusting condition you are experiencing with the half-ton Ford pick-up. It might possibly be caused by an extremely damp condition where the truck is stored. If such is the case, it is, of course, necessary to store it in another place that is drier.

I cannot see that the quality of transmission oil would have any effect on this condition. I would suggest that you thoroughly clean the complete ring gear of rust and also make sure there is no possibility of water being splashed into the clutch housing. I note that you say the car stands in a private garage on a dry cement floor. However, if the atmosphere is extremely damp, it might cause the condition you are experiencing.



Tappet Clearance

I would like to know the valve clearance on White Pancake that is used on the 784 and 788 bus. I would also like to know if they make any more than the one length valve stem and valve lift.—W. E. Morrison, Burnsville, W. Va.

ACCORDING to the factory specifications, the tappet clearance on the White Pancake Model 784, 786 and 788, is zero. This is a 12-cylinder unit and is fitted with hydraulic valve lifters.

Hard to Start

I should like to know if you can tell me what could be wrong with a 1933 PC Plymouth car that is very hard to start on cold mornings. The extraordinary part about it is that a very short push will start the car.

The usual things have been done. Battery is new and has full charge. Battery ground is new and tight. Battery cable is good and connections have been checked. Starter has been

checked, has new springs and brushes, and I can find nothing wrong with it. Seems to run O.K. I have installed new plugs, coil, distributor cap, rotor and condenser. Engine is in perfect time. Compression is good. Oil is light and clean.

This leaves the possibility that there was a short in the starter somewhere and all of the current is going there and none is left for the points, but the ammeter swings back and forth as the points open and close, proving that the points, a new set, are getting current. In other words, the engine absolutely refuses to start unless cranked fast, which, of course, is about impossible on a cold morning regardless of the battery or starter condition.

I have tried different carburetors without correcting condition. I have also tried different gasoline pumps.

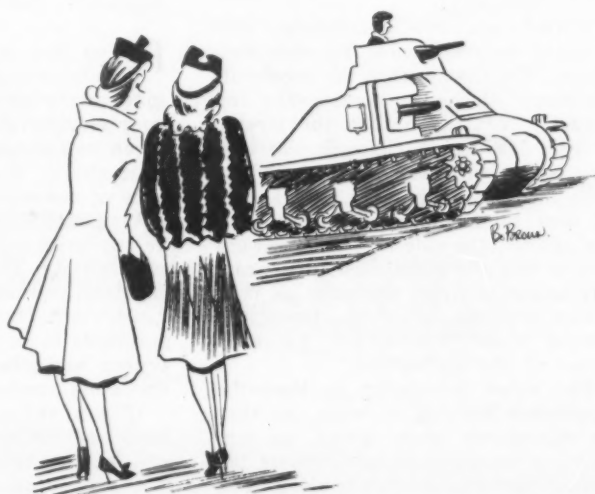
Car recently made a 250-mile trip and never used a single drop of oil and behaved like a brand-new engine. Engine has a very slow idle, and sounds good. Of course, we have overlooked something. But what might it be?—Daniel L. Flynn, 2501 W. Addison St., Chicago, Ill.

ONE point you did not mention checking on that 1933 Plymouth, which is so hard to start, is the engine ground. I note you say the battery ground is new and tight but, in these engines which are mounted in rubber a separate ground is provided and it is, of course, necessary that this be in good electrical condition also.

There is another point, and that is the rings. You state that the compression is good in all cylinders and that no oil is used. I wonder if these rings are so new and the tension of the rings so great that there is not enough current to supply both ignition and starter. If that is the case, the only thing you can do is install a different make of ring which has less tension.

I note you say that the oil is light.

"The whole thing is made of melted-up bobbie pins."



Another Studebaker public service message

As published in U. S. newspapers
during April, 1944

How to increase your truck tire mileage

*A suggestion of vital importance
to all motor truck operators*

THESE war days every truck is at the mercy of its tires.

That's why recapping is so important—it saves tires—and thereby saves trucks for essential wartime service.

Large fleet operators have made it a practice for years to recap their truck tires—but operators of two, three or five trucks do not always realize how much longer tires last when recapped.

Start a recapping program for your tires now, if you are not already doing so. Recap the minute the tread wears smooth. Don't presume you can get new tires. Your ration board may not be able to allot you any, because military needs have increased enormously.

No special permission is required for recapping. But the government urges timely recapping as a transportation conservation measure.

See your truck or car dealer for advice on how best to get your tire recapping done.



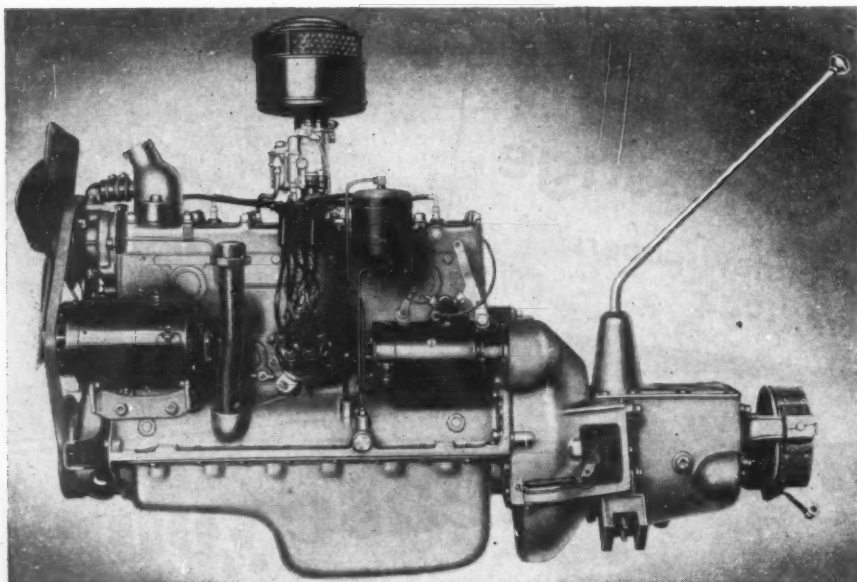
*Two valuable booklets
on truck and tire care*
FREE

These handy, ready reference guide-books are not advertising pieces but valuable wartime aids on the care and maintenance of all makes of trucks. For free copies, see the nearest Studebaker dealer—no obligation. Or write Studebaker, Truck Division, Dept. CC-5, South Bend 27, Indiana.

STUDEBAKER

PIONEER AND PACEMAKER IN AUTOMOTIVE PROGRESS

NOW BUILDING WRIGHT CYCLONE ENGINES FOR THE BOEING FLYING FORTRESS—MULTIPLE-DRIVE MILITARY TRUCKS—OTHER VITAL WAR MATERIAL



Elusive Knock

We have just overhauled a 1936 Dodge that has been taken care of regularly, the only complaint from the owner being that it has been using oil.

We made an oil-pressure test on bearings before we removed them. Only front and one center bearing had tiny streams; the rod bearings dripped very rapidly.

We installed all bearings, pins, rings, reground seats and valves, overhauled distributor, put on new carburetor. Made another oil test on new bearings and used starter. The bearings just had a slow drip.

The car was run on the road for about 50 miles below 25 m.p.h. We had knock at 29 to 31 m.p.h. Below or above this speed, the engine did not have any noise.

The owner has put about 200 miles on the car. This particular noise comes in at about 51 miles and about 35 miles when you apply gas quickly, but on a pull there isn't any noise. The motor is noisy when idling. I have the same kind of noise in my '38 Plymouth at about 30 miles when the gas is applied. Both cars have exponders on piston and rings, and cylinder ridges have been removed. What is your answer?—An Akron, Ohio, Subscriber.

FROM the way you have described the trouble you are experiencing on a 1936 Dodge, I am inclined to believe that someone slipped up in fitting the wrist pins. I would suggest that you check these carefully.

Pulling Flywheel

How do you pull the flywheel on Lincoln Model KB145-1932? Also what kind of a puller do you use? The reason for getting the flywheel off is to stop an oil leak. It is not

known whether the leak comes from the rear main bearing trap or oil line.

Also on Nash-Lafayette 1937 Model 37-10. The main shaft in the transmission was recently broken and replaced. Everything else looked O.K., but it slips out of second going down a grade. Adjusted gear-shift plunger as tight as possible, and it helped only a little bit. Springs were not weak.—A California Subscriber.

THE main trick in getting this flywheel off is to first pull out the three dowel pins which hold it in place. There are three of these pins, $\frac{3}{8}$ -in. in size. Any dowel-pin puller will do this job, or, if you do not have a puller, you can use a short length of $\frac{3}{8}$ -in. pipe and work the dowel pin out by using a nut on the pin against the length of the pipe.

The transmission difficulty you are experiencing with the 1937 Nash-Lafayette can be due to several conditions as a result of the main shaft breaking. My first suggestion, however, is that you try to line up the transmission by installing the lower half only of the gasket between the transmission and the flywheel housing. This sometimes corrects this condition without additional work.

If this does not do the trick, you will have to look for a bent shifter fork, loose main shaft bearings, and play in the main shaft, or poorly fitted gears.

High Oil Pressure

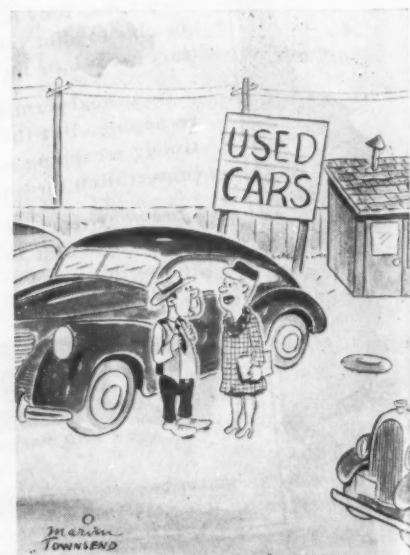
We have a 1937 Master De Luxe Chevrolet that is carrying too high an oil pressure at high speeds. The crankcase is filled with SAE 10 oil. At 30 m.p.h., it has an oil pressure of 15 lb.; at 40 m.p.h., 18 lb.; and at 50 m.p.h., 20 lb., while at higher speeds it has a maximum pressure of 25 lb. when hot.

We have cleaned the crankcase, tested and cleaned connecting-rod oil nozzle pipes, and they throw uniform streams. We have blown through the other oil channels in the block. Have tried a new oil gage, and new pressure unit in the oil-distributor body, and have left the unit out of the distributor body, but the pressure remains the same. Before removing the crankcase, we did succeed in lowering the pressure about 3 lb. by putting a can of break-in oil in the crankcase. This is what leads us to believe that there was a back pressure, due to sludge that was responsible for this high pressure.—A Voorheesville, N. Y., Subscriber.

PERSONALLY, I have never worried about an engine that shows an excessive amount of oil pressure provided that I was sure the oil was going to all of the working parts.

It is possible that some of the oil passages in this particular block are slightly smaller than standard, which would account for the higher pressure. The only point I would caution you about and which was not mentioned in your letter is to be sure that the rocker-arm shaft is free, so that oil is going to all the rocker arms. If you find that they are get-arms.

The line that feeds the rocker arms can be blown out with compressed air at the rocker arm fitting. If you find that they are getting a sufficient supply of oil and you are sure that the points mentioned in your letter have been carefully checked, so that there is no obstruction in those oil passages, I would have no further concern over the amount of oil pressure shown, as long as it does not drop. I can see no reason why an excessive pressure should cause any trouble and, to my way of thinking, it is a safeguard rather than an indication of trouble.



"To hell with how it looks. Let's hear the motor!"

TO PROFIT!

STONES

STEPPING



For many years, thousands of repairmen have been stepping high to profitable business with McQuay-Norris Altinized Engineered Set Piston Rings. Like them, you can avoid come-back jobs by installing these precision replacement rings specifically engineered for each make and model... Your McQuay-Norris jobber will help you take your first step toward bigger profits.

Always call your McQuay-Norris jobber first!

McQUAY - NORRIS

PISTON RINGS • PISTONS • PINS • VALVES
BOLTS • BUSHINGS • SILENT-U SHACKLES



BEARINGS • SLEEVES • PUMP PARTS
WHEEL SUSPENSION PARTS

Big Small Shop

(Continued from page 27)

and the time a mechanic gets to work. For this reason, emergency calls get the immediate attention they require. Hartley's is known for this quick, reliable service, and local towing companies bring in jobs each day simply because they know that the owners will get quick, complete service and at a fair price. Hartley says he doesn't believe in getting all the money the first time. Probably 30 per cent of the jobs the shop turns

out each day are due to emergency breakdowns.

Up till now Hartley has avoided expanding, turning down offers of partnerships, and such, because he felt they would be exactly opposed to his theory of operation. Now he feels he is ready to grow another step and has plans for the post-war period. But he has also determined that he will never grow so big that he can't be on the floor a large part of every day. He doesn't believe shops should ever be that big.

And this personal contact with the customers—this small-shop philosophy—is what makes his shop outstanding.

Because the boss is always on the job, slipshod work doesn't get by. Because of it, he can honestly say that four out of five new customers come to him because of personal recommendation. When, at one time, he wanted to obtain a loan from one of the large city banks, it was granted immediately and without collateral because, as the banker put it, "Several of the boys know how you operate."

Is there any higher praise?

The Name Is Olds



RANSOM E. OLDS entered the automobile business with the very earliest pioneers, after being manager of the P. F. Olds and Son, Lansing, Mich. His first car, a steamer, was sold to a native Indian ruler, but the ship carrying it sank, and the car was never delivered.

His first company was the Olds Motor Vehicle Co., in Lansing, which he organized in 1897. Two years later, the company was reorganized, moving to Detroit as the Olds Motor Vehicle Works. Both firms produced the Oldsmobile.

Olds withdrew from the company in 1903 and organized the Reo Motor Car Co., at Lansing. This firm produced the Reo, a name created from Olds' initials, and still familiar as the name of a truck.

Takes Truck Zone

Appointment of T. F. Kilcommons as Eastern zone manager of Studebaker's Truck Division has been announced by R. G. Hudson, manager. Promotion and extension of Studebaker's wartime-truck conservation program in the highly important New York and Boston metropolitan areas will receive Kilcommons' major attention, it was further stated. Kilcommons, who will headquarter in New York City, has had 25 years' experience in the motor truck field.



MARVEL MYSTERY OIL goes to work **TWO** ways to keep aging wartime motors young and healthy. First, when you add it to your customers' lubricating oil, it halts excessive engine

wear—because, it lubricates critical upper cylinder areas and protects valve stems and guides with reinforced lubrication. In high heat combustion areas, where ordinary lubricants fold up, Marvel Mystery Oil sustains its remarkable efficiency. Second, when you add it to fuel tanks, it improves the performance of today's low octane gas and prevents accumulation of power killing fuel residues and gums.

No wonder **MARVEL MYSTERY OIL** is in wide demand among **ALL** your customers right now . . . for millions of car owners it is one answer to maximum motor efficiency and continued operation. Are you ready to meet this huge demand? Ask us for the whole profitable story today. Emerol Manufacturing Co., Inc., 242 West 69th St., New York 23, N. Y.



MARVEL MYSTERY OIL



*there is
money in
repairing
armatures*



THOUSANDS of shops throughout the country are getting faster, better, more profitable production, with the TRUCUT Armature Lathe and Undercutter.

There are real profits today in repairing armatures with the TRUCUT. You can machine and undercut commutators, make them like new in five minutes, and you get maximum profit out of each job that comes in. That's why so many shops are equipping with TRUCUT.

With today's shortage of labor, the TRUCUT Armature Lathe and Undercutter is the perfect answer for more production and more profits. Let us tell you about the actual experiences of some of the many shops that are TRUCUT-equipped. Write us, or see your jobber, today.



Also TRUCUT Mica Undercutter
Tailstock Rest, General Purpose Press

FRANK N. WOOD CO.

TRUCUT
Armature Lathe & Undercutter

344 W. MAIN STREET • WAUKESHA, WIS.

PACIFIC COAST ADDRESS: 1340 S. FLOWER ST
LOS ANGELES 15, CALIF.



Post-War Super Service

(Continued from Page 22)

we don't intend to get into that kind of a business.

"But there are any number of automotive items the average shop hasn't bothered with. And it has been missing a bet. The volume of business done by the so-called auto supply stores proves there's a big volume of business to be had in handling supplies and small tools and accessories. The automobile owner would rather buy from the service station and re-

pair shop. He has to visit the station or shop, anyhow, so it's easier for him to buy everything he needs at the one place.

"We're trying to make it possible for customers to do that right now, as far as wartime restrictions will let us. After the war, we're simply going to extend the scope of our service and the variety of our automotive merchandise. We'll really have super service, and super service is going to pay off after the war."

The Coker station is well-suited to these plans. Built in cooperation with an oil company, the one-story building, with its white-stucco front, occupies

a corner on wide Government St. In the front of the building are the rooms containing the merchandise display and the office, a lubrication and washing bay, and two large bays for service and repairs. The tire-service department is entered from the side street. Used cars are displayed around the building.

At the present time, the operation of the station is divided between the brothers. Perry Coker, as before mentioned, handles fuel and car sales and the tire-service department, S. B. Coker is in charge of all repairs and service other than tires.

Because of the wartime limitations on the labor that can be employed and the materials that can be obtained repairs are restricted just now to quick service, brake work, motor tuning, wheel alignment. The shop also does some frame straightening. It is equipped for all types of engine work, including complete overhauls, but the Cokers consider the other types of work of greater importance, considering the lack of skilled help obtainable. Engine work will undoubtedly be resumed after the war.

Ten men are employed by the Cokers at present, three in the shop, two on washing and lubrication, two on gasoline and oil sales, and three in the tire department. After the war, when help again becomes plentiful, the Cokers are certain that twice this number can be profitably employed in providing the wide range of automotive service for which the shop is designed and for which the brothers are planning.

4 Elected Directors

Willard H. Cobb, George M. Tisdale, George P. Edmonds, and Harry S. Lewis were elected to the board of directors of United States Rubber Co. at the annual stockholders' meeting April 18.

Cobb has been employed by the rubber company more than 30 years, and is general manager of the mechanical goods, general products, and "Lastex" yarn and rubber thread divisions.

Tisdale has been employed by the company since 1920, and since 1929 has been director of purchases.

Edmonds is president and director of Bond Crown and Cork Co., of Wilmington, Del.

Lewis is president of The J. P. Lewis Company.

Holds Sales Conference

The Pennsylvania Rubber Co., of Jeannette, Pa., held a series of Sales Planning Conferences on March 20 to 22 at Jeannette and Greensburg, Pa. R. B. Cave, general sales manager for the company, was in charge of the meetings. The purpose of the conferences was to discuss data and plans which will help Pennsylvania dealers to meet current conditions and post-war developments.

for LONGER LASTING REPAIR JOBS...

USE BUNDYFLEX

Original Equipment

COPPER COATED METAL TUBING



BUNDYFLEX
COPPER FUSED METAL TUBING
MUCH STRONGER! - LASTS LONGER!
ORIGINAL EQUIPMENT ON AUTOMOBILES, TRUCKS,
FARM TRACTORS, OIL BURNERS, AND GAS APPLIANCES.
WILL NOT BREAK OFF OR CRACK OFF AT THE JOINTS DUE
TO 100% GREATER RESISTANCE TO VIBRATION FATIGUE.
Can Be Easily Bent - Flared - Braided or Welded!
EVERHOT PRODUCTS CO. CHICAGO, U.S.A.

Easy TO BEND
Easy TO FLARE

Use Our
FLAREMASTER
Flaring Tool
for a perfect
double-flap
flange.



ALWAYS BETTER THAN COPPER TUBING FOR AUTOMOTIVE INSTALLATIONS

DEALER PRICE \$8.95

GET THIS HANDY Dealer Display ASSORTMENT

- Attracts attention; creates sales, builds bigger profits for the dealer on replacement metal tubing.
- Contains the following fast selling sizes:
 - 2-25-ft. coils 3/16" BUNDYFLEX TUBING
 - 2-25-ft. coils 1/4" BUNDYFLEX TUBING
 - 2-25-ft. coils 5/16" BUNDYFLEX TUBING
 - 1 Colorful SIGN and DISPLAY FIXTURE

LIST PRICE each \$16.00 Dealer Price each \$8.95

EVERHOT PRODUCTS CO.
2055-59 W. Carroll Ave., Chicago 12, Ill.

IMMEDIATE DELIVERY: Your Jobber carries BUNDY-FLEX TUBING in 25-ft. coils, 1/8" to 5/8", for gas, oil and brake lines, etc.

FILL IN AND MAIL COUPON TODAY

Be sure to give Jobber's name.

EVERHOT PRODUCTS CO.
2055 W. Carroll Ave., Chicago 12, Ill. DATE _____

Deliver Dealer's Display Assortment of BUNDYFLEX Tubing to us, through jobber, at Dealer Price of \$8.95.

NAME _____

ADDRESS _____

CITY _____ STATE _____

JOBBER'S NAME _____

JOBBER'S CITY _____ STATE _____



NEW TOLEDO HORIZONS—Vision, inspired dreams, hard work and a firm belief in the freedom of individual initiative have always been evident in the accomplishments of Toledo Steel. It is all of this, plus a typically American ambition to have products of the finest caliber possible upon which our entire planning has always been predicated. So it is on this basis of quality that we lay the groundwork for tomorrow's postwar market. Perhaps this is the reason Toledo continues to be the unqualified choice of "America's Men Who Know Motors!"

The TOLEDO

STEEL PRODUCTS COMPANY
TOLEDO, OHIO • U.S.A. • SINCE 1906



Makers of Fine Automotive and Aircraft Parts

Jack of All War Trades



Herman Layne, tire repairman, of Sherman, Tex., is doing some war work in his shop. It consists of repairing a worn-out washing-machine roller. When war started and rubber supplies were cut off, Layne turned to repairing all sorts of rubber goods, boots, coats, toy tires.

Legally Speaking

A lawyer's interpretation of federal and local court decisions of interest to repairmen, presented each month

By C. R. ROSENBERG, JR.

Written and Oral Contract Too!

Repairmen have learned to their dismay that oral promises made in connection with a written contract cannot be relied upon. This is because a legal rule forbids changing the terms of a written contract by oral testimony.

A California court recently pointed out, however, that, if the oral deal is not inconsistent with and does not affect the written contract, the oral agreement is legally valid. To put it another way: You can have both a written contract and an oral agreement about the same subject matter, provided they do not conflict.

"Undoubtedly it is the law," said the California court, "that the execution of a contract in writing supercedes all the negotiations or stipulations concerning the matters which preceded or accompanied the execution of the agreement, but in the case before us at no time did the parties attempt to vary the terms of the written contract or impinge on its contents. Their collateral oral agreement referred in its entirety to matters which were not inconsistent with and did not in any wise qualify or impair the terms of the written contract, even though it be conceded that it related to the same subject matter.

"Proof is always admissible of any collateral oral agreement, or of any

independent fact which is not inconsistent with or does not qualify any of the terms of the written contract, even though it may relate to the same subject matter." (*Dobbins vs. Horsfall*, 136 *Pacific Reporter*, second series, 35.)

Agent Is Not Responsible

When a repairman enters into a written contract for service, equipment or other items and an agent or representative signs for the other party, the repairman ordinarily has no legal redress against the agent if anything should go wrong. His only legal remedy is against the principal for whom the agent signed, unless in some way the agent assumed personal responsibility at the time the contract was made. The fact that the agent may be financially responsible merely means that he is able to pay, not that the law will make him pay.

As the Supreme Court of Pennsylvania put it in a recent case:

"When the execution of a contract is by written obligation, or sealed covenants, the agent cannot be sued upon the instrument itself, unless there be apt personal contractual words of his own, or he sign it as his own.

"There can be a recovery against the agent only in such case where he assumes, by appropriate words, individual responsibility. But this per-

sonal responsibility must be shown, and it cannot be proved if the body of the contract, as well as the signature, discloses that he is acting only as agent for another." (*Pennsylvania Co. vs. Wallace*, 31 *Atlantic Reporter*, second series, 71.)

Elevator in Building

A repairman operating a passenger elevator in his place is in a legal position somewhat similar to that of a railroad so far as the safety of passengers is concerned. Where passengers on a railroad train are hurt, the railroad is presumed to be responsible for the passengers' injuries unless it can be definitely proved that it was not at fault.

Making this comparison between elevator and railroad a Texas court recently said:

"The law has imposed upon the proprietors of passenger elevators duties precisely similar to those exacted of passenger carrier by railroad. While the owners of passenger elevators are not insurers of the safety of their passengers, they are bound to exercise in their behalf the highest degree of skill and foresight, or, as some courts have expressed it, the utmost human care and foresight consistent with the efficient use and operation of the means of conveyance employed." (*Dulaney vs. Wood*, 142 *Southwestern Reporter*, second series, 379.)

Silent Fraud

Fraud, especially in connection with a sale, usually takes the form of some false representation about the goods or service, but a Federal court pointed out that it is possible to perpetrate a fraud by keeping quiet.

The court based its conclusion on the principle that, where a seller is under a duty to make a disclosure concerning the goods or services he is selling, he commits a fraud by saying nothing.

"The suppression of a material fact which one is bound in good faith to disclose," said the court, "may be equivalent to a false representation."

Whether or not a fact is material and must be disclosed depends upon the nature of the goods or service being sold and the circumstances of the transaction. For example, if a lot of merchandise is made up of "seconds," and the circumstances are such that the buyer might think they were first quality, there would be an obligation on the seller to make a disclosure of the true facts, especially if the nature of the defects were such that they could not be discovered by the buyer on an ordinary inspection. It is the withholding of such a material fact by a seller that constitutes fraud by silence. (*Shepard vs. City*, 24 *Federal Supplement*, 682.)

Young Horsepower for old motors



● Casite national advertising tells millions of car owners, over and over again, that *clean motors run better, last longer, and use less fuel*. And it tells them to keep their horsepower keen—their motors clean—with Casite. Tie up with Casite's Double-Your-Money-Back Guarantee Campaign, and with Casite's ever-expanding consumer advertising program. Your jobber salesman knows the answers. Ask him.

The famous Casite "horsepower horses" appear regularly in Casite advertisements in these outstanding city and farm consumer magazines:

- Saturday Evening Post
- Popular Science
- Liberty
- Popular Mechanics
- Country Gentleman
- Mechanix Illustrated
- Successful Farming
- Science & Mechanics
- Farm Journal

THE CASITE CORPORATION • HASTINGS, MICHIGAN

GUARANTEED AS USUAL

*Smoother and Better Performance
or Double Your Money Back*

GUARANTEE

Add Casite to crankcase and run through carburetor according to instructions, then drive your car 100 miles or for 60 days, whichever is first. If not convinced that Casite gives you better and smoother performance, you get double your money back by filling out guarantee certificate and mailing it to The Casite Corporation, Hastings, Michigan. Maximum refund is \$1.30 per pint, twice the nationally advertised price of Casite.



CLEANS OUT MOTORS • KEEPS MOTORS CLEAN

Mechanics in Star Roles

(Continued from page 29)

tact with their customers, are given authority to drop any non-essential job temporarily to go to work on one that needs service without delay.

Most complaints are handled by the mechanic who served the customer, provided a large sum of money is not involved. However, the shop gets few complaints, even though all work is guaranteed.

The system of direct contact between mechanic and customer has re-

sulted in a bigger volume of work, even though the force of mechanics is smaller and overhead lower. There was a time when the Union Motor Co. had 56 employees. Now every first-line mechanic and his assistant turns out enough extra work to offset the loss of men.

Customers have stopped shopping around. They are so completely satisfied with their dealings with "the man who does the work" that they keep coming back. Most of these regular customers want no other mechanic than the one to whom Watson introduced them when they brought in their car the first time. Often, when

that mechanic is busy on a rush job, the customer will stand around and wait to talk to him.

Watson says, "The close contact our customers have with the mechanics influences them to have more complete reconditioning jobs done. Of course, car owners have more money to spend now on repairs. But a lot of them have their cars completely worked over, not merely because they have the money to pay for it but also because they have confidence in the man who does the work."

When a customer wants to take advantage of the invitation to watch a job while it is being completed, he is shown into a large, well-lighted service department where he can closely observe everything that is done to the car.

The service set-up includes a well-equipped body shop, which contributes \$15,000 monthly to the \$25,000 service volume. Much of this work is done on trucks. Because most of the work is driven in by the customer, no wrecker is maintained. An arrangement is had with another company to haul in wrecks when necessary.

The men work strictly on commission. They are paid commissions not only on service work but on any used cars they sell. Each man has a key to the shop. At regular meetings and during the informal get-togethers that often follow the day's work, the men are encouraged to discuss their experiences with customers.

Because so many customers visit the shop, two porters spend all their time keeping the quarters clean. One of their regular jobs is to sweep out every customer's car, an extra attention that creates good-will.

The slogan carried in all advertising is, "When New Fords Are Built, We Will Again Sell the Most." Until that time comes, says Watson, the spotlight will be kept on those who man the service department.

"They're our stock-in-trade now," he declared. "We can't display cars, so we display our only profit-makers—our service boys. Turning the spotlight on them is as valuable as it used to be when turned on a bright new automobile behind our plate-glass windows."

War Service Described

The Hudson Motor Car Co., has issued a booklet entitled "Hudson Looks Ahead", which describes in word and picture the contribution of the company to the war effort through the production of many types of war equipment, including engines and wing sections for warplanes, and marine engines.

Tribute is paid to Hudson dealers for their share in servicing vitally needed cars during wartime, and to Hudson men serving the country in uniform. After the war, the booklet promises, the company will resume the production of cars and trucks.



The use of McAleer Automotive Finishing Materials in your collision and body maintenance work, like a good court brief prepared by a lawyer who knows his judge and jury, shows that you know your business.

Shrewd Service Operators are "cashing in" on the new business to be had, by simply emphasizing the fact that *a car doesn't wear out so much from use today, as from neglect*. Pointing out the fact that protecting the finish and appearance of a car is protecting an invaluable investment, is a method of selling service that's replacing plenty of profits lost through war restrictions.

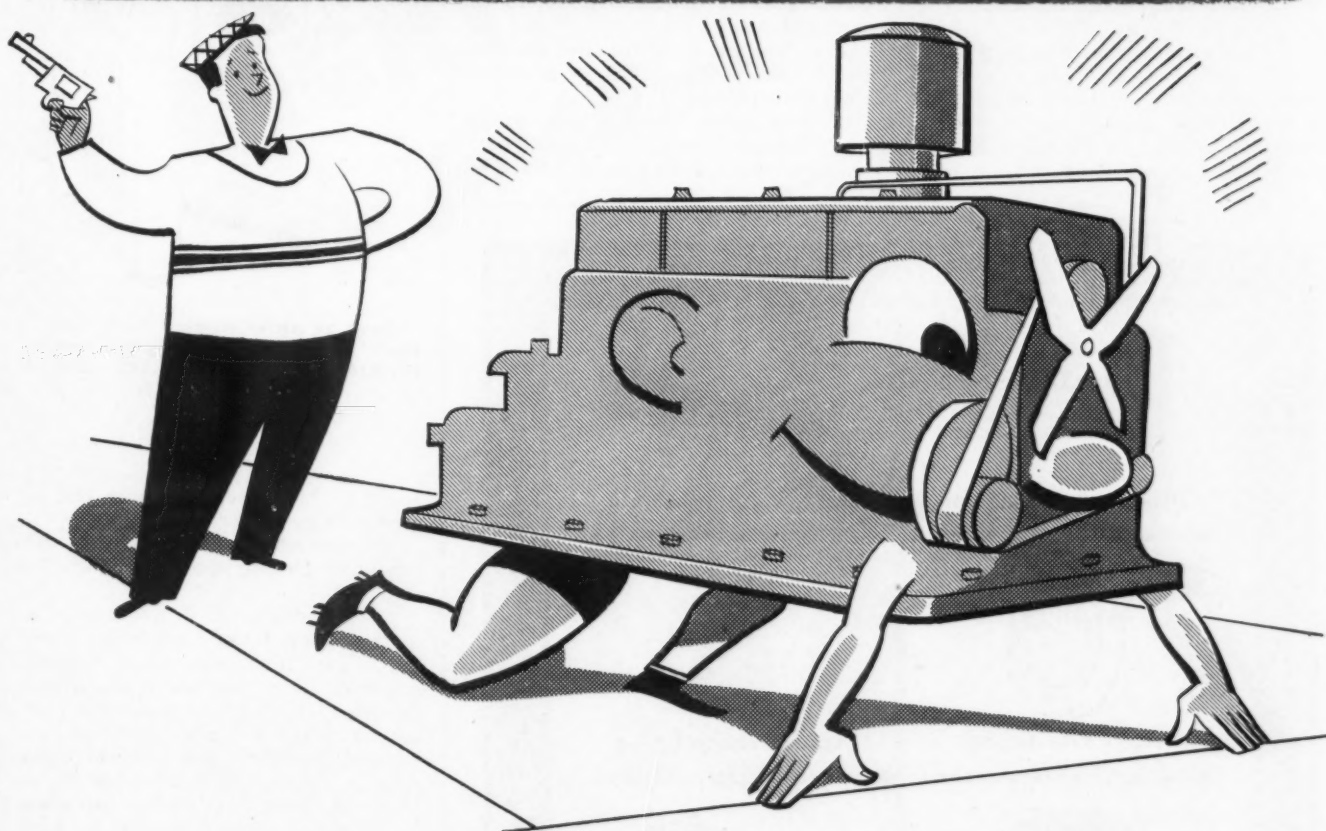
As the war continues, car owner work will be more important. It should be the biggest part of your shop business. This means putting emphasis on the highest type of body repair and repaint services—that's what car owners have always demanded in the appearance reconditioning of their cars.

In body repainting and maintenance work, top money-makers in the shop have always been McAleer's *SPEEDIE-RUB*, the two-way *POLISH* and *CLEANER*, and *QUICKWAX*. You and your customers both benefit when you use these job-tested, *quality-controlled* finishing materials. Your customer's car receives the protective benefits which maintain the high dollar value of his car—you receive car owner good will, increased business and extra profits.

Job-test one or all three of these products for faster, better, more economical finishing results. They can be *the extra profit makers NOW* and *the postwar business builders of tomorrow* for you. Better phone your local Jobber *NOW*—while you think of it. *That's getting down to cases!*

McAleer **MANUFACTURING CO.**
Quality-Controlled Finishing Materials
ROCHESTER, MICHIGAN

Anxious To Go Places!



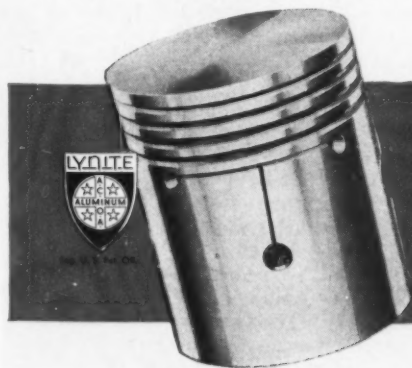
The engine that's powered by Lynite* LO-EX Pistons is just naturally more on its toes and ready to go. These pistons have low coefficient of expansion, permit close clearances, give maximum heat flow. Oil and gas consumption and carbon formation are held to a minimum. Their lighter weight reduces bearing pressures, so bearings last longer. The result is smooth performance, low cost operation and long life.

Lynite LO-EX Pistons are standard in much of our fighting equipment, just as they were in so many engines before the war. The demands

of the military services have, of course, been largely limiting the use of these pistons to essential vehicles. But when more aluminum can be had for civilian purposes, Lynite Pistons will be available on a much broader scale.

When our fighters return to civilian life, they will find these performance-improving pistons ready to give them the same kind of service as they have become accustomed to in everything from jeep to giant tank. ALUMINUM COMPANY OF AMERICA, 2133 Gulf Building, Pittsburgh 19, Pennsylvania.

*Lynite and LO-EX are registered trademarks.



LYNITE LO-EX PISTONS... A PRODUCT OF
ALCOA ALUMINUM

Universal Joint Service

(Continued from page 25)

to the springs. They couldn't have a solid shaft between them because the axle keeps bouncing up and down when the car is moving. The universal joint lets the shaft move up and down with the rear axle."

"That's about right. But, of course, it does somethin' else. The axle shaft don't move up and down in an arc with the transmission as a center. That means it's a little farther from the transmission at some points than

it is at others. The difference has to be taken care of somehow. It's done with a slip joint in the universal. What actually happens is, the joint slides back and forth on the splined end of the propeller shaft."

"I see that, all right," said Tommy. "But you said something about having to worry about the rear universal joint—that it had something to do with balance."

Pop took an envelope and made a rough lead-pencil sketch of a cross-type universal joint.

"You're gettin' me into deep water now, Tommy," he said. "You know a universal joint don't turn at the same



"I have an awful memory for names. I think of you as 'Mr. Motor Number 373,834, license plate 72,345—last oil change January 10.'"

speed all the time, even with the engine making the same r.p.m.'s."

"It doesn't?" asked Tommy. His tone told clearly that he believed it did.

"No, it don't. If I was better at mathematics, I could prove it to you, but I can show you what happens, anyway. Let's take the front universal, and let's say the yoke that's attached to the propeller shaft is in a vertical position. And say the other yoke is turnin' over at 1000 r.p.m. When the rear yoke of the universal is in the vertical position it ain't travelin' at 1000 r.p.m. but only at about 850. As it keeps turnin', it picks up speed and, by the time it's in the horizontal position, it's travelin' at about 1150 r.p.m."

"Gee," exclaimed Tommy, "that would make a car pretty rough, wouldn't it, with the propeller shaft turning slow and then fast?"

"Not so bad as you'd think, but there's a couple of ways of eliminatin' the unevenness altogether. The first way is to use two universal joints. The yokes on the ends of the propeller shaft is set in the same plane. That way, the varyin' speed in the propeller shaft is transmitted as steady motion. In other words, with two joints the variation in speed is cancelled out. Now you can see why them arrows have to match up. If they didn't, the drivin' yokes of front joint wouldn't be at exactly the same angle as the driven yoke of the rear joint, then instead of cancellin' out, the difference in speed would be added and the vibration would knock the fillin's out of your teeth."

Tommy nodded.

"But all cars don't use two universal joints. Makes that use a torque tube only have one. In that case, the unevenness can be overcome by usin' (Continued on page 60)

	
VISIBLE FRONT AND SIDE	CHANNEL BAR MOUNTING
	
FLUSH TYPE LIGHTS	FLEXIBLE BRACKET TYPE
	
TWO WAY MARKER	RIGID ANGLE BRACKET

**Competent Guardians
of Valuable Cargoes**

Tough, durable, Marker Lights are an Arrow tradition. Years of satisfactory performance on the highways all over the nation have made them popular with owners, operators, and shop men everywhere. Ask your jobber salesman about Arrow Lighting Equipment or write direct for catalog.

ARROW
SAFETY DEVICE CO.
MT. HOLLY, N. J.

SEALED-BEAM
HEADLAMP
ADAPTER KITS
FOG LAMPS
MARKER LIGHTS
SAFETY FLARES
SIDEVIEW MIRRORS
REFLEX REFLECTORS
DIRECTIONAL SIGNALS
PARKING LIGHTS
STOP LIGHTS
TAIL LAMPS
DOME LIGHTS



RIGHT...
the first time!

Scant seconds ahead of on-rushing Panzers, our sappers mine a vital bridge that can't be held. A geyser of blasted rubble shows their job was done right... the *first time!*

In brake work, too, you'll find it pays to be *right*—from the very start... with the precision that Thermoid gives you on every brake job!

Just as they come to you from the distributor, Thermoid Precision Processed shoes make full, even contact with the brake drums... give quick, quiet, smooth stops—without tinkering or customer call-backs.

Thermoid Custom-Built Brake Lining Sets, too, are precision products... each set is certified by Pittsburgh Testing Laboratory to be correct for the car it fits.

You'll find that Thermoid Precision Processing is the exclusive, extra care that makes every reline job *right*... the *first time!*

Thermoid

Custom-Built
Brake Lining Sets

plus

Precision Processing

THERMOID CO., TRENTON, N. J.

Don't Put It Off 'Til Tomorrow —
BUY MORE WAR BONDS TODAY!

Universal Joint Service

(Continued from page 58)

what is known as a constant-velocity universal. There's several designs of these joints but the principle is always the same—the joint transmits power at a uniform rate from the driving shaft to the propeller shaft."

"There's more than just two kinds of joints, aren't there?" asked Tommy. "I've seen a lot of different kinds of cars that come in here."

"Sure," said Pop. "There's only two types, but there's several differ-

ent designs of each. For example, among the plain joints, there's the cross type. Sometimes you hear it called the Cardan or the Hooke joint. Even that's designed in different ways by different makers. Then there's a block-and-trunnion type, a split-ring type, and a square-block type. Besides, there used to be fabric joints and a rubber-bushed joint, but they ain't used any more."

Tommy, who had been leaning over the desk as Pop was sketching out his explanations on the backs of envelopes, straightened up.

"I guess you'd have an instruction for each different type if you had to

service a universal joint," he suggested.

"Yes, you would," said Pop, "but you wouldn't need 'em very often. A universal joint is about as foolproof as anything in an automobile. Except for wear or damage, there ain't much can happen to 'em. When that happens, of course, you have to replace 'em, just like we did on Doc Fay's car out in the shop. But, as a general thing, you don't even have to lubricate 'em. The lube put in 'em at the factory ought to last as long as the car does."

"But, when you do have to lubricate a universal joint," he continued, "you want to make sure you put in the right lubricant. It has to be a fiber grease and should have a high melt-in' point. And never put in too much. If the joint is the kind that's protected by a boot, the lubricant's likely to be thrown out and build up in a lump on one side, and throw the assembly out of balance." Pop tossed the pencil aside and dropped the scribbled envelopes into the waste basket.

"That's about all we'll have time for tonight, kid," he said, rising. "I got to get home to some cold food and some heated words from the little woman." When Tommy, thinking discretion the better part of valor, remained silent, Pop went on: "The bird that invented a joint with constant velocity must 'a' got the idea from a woman's tongue."

Starts New Building

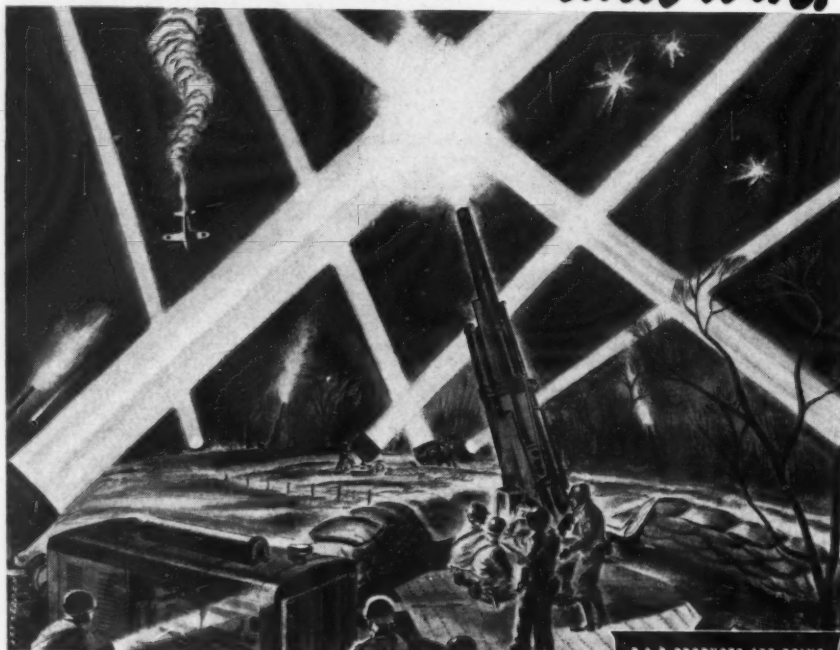
Announcement is made by the Duro Metal Products Co., Chicago, Ill., that ground has been broken for a new addition to its Kildare Ave., plant. The new building will provide substantially increased production facilities to meet the military and war production demands for Duro hand and machine tools. The announcement points out that, while first call on Duro's production facilities goes to the military and the war factories, every effort, consistent with meeting these requirements, is being made to provide tools for automotive maintenance and other essential civilian requirements.

Takes Wholesale Post

Charles M. Sherwood, recently resigned as Branch Chief in the Copper Division of the WPB at Washington, D. C., has joined the executive staff of the Joseph Strauss Co., Inc., Buffalo, N. Y., in charge of all wholesale activities of the company, it was announced by Luke Strauss, president. He is to succeed Edward T. Ball who so ably served the company for 29 years. The appointment of Sherwood is a part of the company's broad plan for continuing present war production and distribution activities.

The Joseph Strauss Co., Inc. is one of Buffalo's oldest and largest automotive and parts distributors serving Western New York.

concentrate on one... and win!



... Concentrate on the best line . . . and P & D ignition replacement parts for trucks, buses and passenger cars . . . will increase the number of satisfied customers by keeping their equipment at its peak.

America's leading service station owners know from experience that concentration on the complete quality line helps their business. The three benefits of concentration are always there with P & D.

P & D PRODUCTS ARE DOING THEIR BIT WITH OUR ARMED FORCES IN VARIOUS THEATRES OF WAR

3 P & D BENEFITS

1. Minimum inventory, because one complete line.
2. The best is always at hand, because P & D make only one quality . . . the finest.
3. Customer satisfaction, because good work plus P & D parts means peak performance.



YOU CANNOT PURCHASE ANY FINER QUALITY

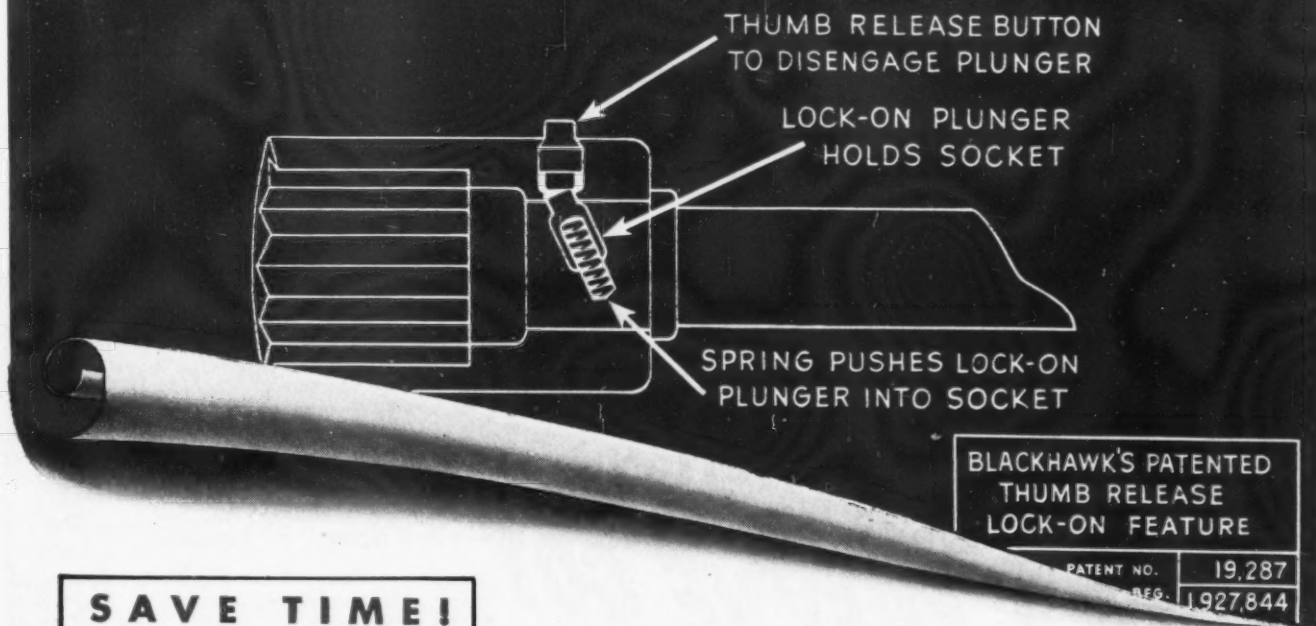
P & D MANUFACTURING COMPANY, Inc.

LONG ISLAND CITY, NEW YORK
STARTING · LIGHTING · IGNITION
REPLACEMENT PARTS

P & D MANUFACTURES ONE COMPLETE QUALITY LINE. ONLY THE FINEST MATERIALS AND WORKMANSHIP OBTAINABLE ARE EMPLOYED

3612

BLUEPRINT FOR YOUR WRENCH FUTURE...



SAVE TIME!



Eliminate need for groping into the job for sockets and attachments that slip off the handle. "Lock-On" plunger springs into hole in socket wall—prevents slip-off!

Enjoy Socket Wrenches with Thumb-Release LOCK-ON ... at no extra cost!

Get the most for your wrench money! Blackhawk Socket Wrenches *give you the most*—and it only takes a minute to see why. There's patented "Lock-On", for example... it keeps sockets from falling off into oil pans, hot machinery and cramped quarters. Also "Gripline" handle design... wipes clean and free from dirt—no ugly, uncomfortable cross-knurls. Blackhawk gives you the steel, the clean broaching, the balance, the extra utility and the lightweight—all of which make you a better workman and "King of the Shop"!

Buy Blackhawk Wrenches from your jobber.

A Product of **BLACKHAWK MFG. COMPANY**, Dept. W654, Milwaukee 1, Wis.

PLAY SAFE!

Loose sockets can cause damage! That's why aviation men recognize importance of "Lock-On". Socket cannot stick to nut when you pull away from work.

(PHOTO—COURTESY, NORTH AMERICAN AVIATION, INC.)

SAVE TEMPER!



It's great not having to cuss combinations that slip apart accidentally. But when you want 'em apart—simply press "Thumb-Release" button!



BLACKHAWK MFG. CO.
Dept. W654, Milwaukee 1, Wisconsin

Please rush Blackhawk Wartime Wrench Booklets.

Name _____

Address _____

City _____ State _____

BLACKHAWK

ONLY Blackhawk Gives You "Lock-On" in 3/8"—7/16"—1/2"—3/4" and 1" Square Drives

Joint Surplus-Goods Plan Urged at MEWA Sessions

A discussion of ways and means of handling government surplus automotive parts and equipment and the presentation of the association's new trade-magazine program featured the regional conference held by the Motor and Equipment Wholesalers Association at New York on April 17 and 18.

After detailing the difficulties which are expected in the disposal of surplus automotive parts, supplies and equipment, A. H. Eichholz, general

manager of the Motor and Equipment Manufacturers Association, recommended that a joint committee representing all the automotive associations be appointed to draw a plan which would then be presented to Congress as reflecting the thinking of the entire automotive industry as the best method of handling and disposing of surplus automotive war goods. It was also recommended that the manufacturer of each product should have the opportunity of purchasing his particular products at a price above that named by the highest bidder.

To insure still further that such products would not get into specula-

tors' hands, it was also voted that the proposed committee include a clause in its recommendation permitting the government to recapture any parts or equipment which are being sold in a manner violating any law that would be passed.

Details of the advertising program of the wholesalers' association was presented by B. F. Stevens, of the Van-Auken-Ragland, Inc., who stated that the importance of the automotive wholesaler in the war and post-war periods would be emphasized in the advertisements.

Attendance at the New York Regional Conference exceeded that of the previous year, as did the number of manufacturers represented. At the New York conference 133 manufacturers had booths, which was an increase of 55 over 1943. At the Chicago conference, 177 manufacturers are planning to have booths, while only 80 used booths last year. At the 1944 New York conference, 30 manufacturers were unable to get booth accommodations, while 20 were unable to obtain booths at the Chicago conference.

Gilbert V. Egan

Gilbert Vivian Egan, treasurer and assistant secretary of the Nash-Kelvinator Corp., died at his home April 7. For more than a year, he had been suffering from a mild heart ailment.

Born in Lyon County, Kans, he was well-known in business, banking and financial circles. He was 52.

Egan joined the Kelvinator Corp. in 1927 and shortly after received his appointment as assistant treasurer. He was elected treasurer of the Nash-Kelvinator Corp. in 1939 following the merger of Nash Motors and Kelvinator.

Becomes Ad Manager

William K. Ryan has been appointed advertising manager of the Inland Rubber Corp., it has been announced by William M. Collins, president.

Prior to this appointment, Ryan had for five years been associated with the Reuben H. Donnelley Corp., Chicago, where he was in charge of advertising sales promotion, directory usage promotion and market research. Previous business experience included publishing, news reporting, business paper editing, production and space sales.

Takes New Post

Lloyd C. Smith, whose career in the file industry dates back to 1912, has become associated with Heller Brothers Co., Newark, N. J., in a sales capacity. To accept the new position, Smith resigned as sales representative in the New York metropolitan area, of the Nicholson File Co., Providence, R. I. He had held this post for the last seven years.

AP ENGINEERED CONSTRUCTION

MEANS THEY'VE GOT THE GUTS

In the toughest conditions of service, AP Mufflers stand the gaff! Designed right with AP ENGINEERED CONSTRUCTION... ruggedly built to deliver ORIGINAL EQUIPMENT PERFORMANCE. Garage and service men everywhere know—you can't beat AP Mufflers for top efficiency and long satisfaction!

The AP Parts Corporation,
Toledo, Ohio.

AP

MILEAGE GETTING MUFFLERS

CUT DOWN B.P. WITH
(BACK PRESSURE)

More Speed

... Snap-ons deliver it ... with less effort and greater accuracy. You can feel the difference ... in the fast, solid way a Snap-on "snugs-on" to a nut ... in the bull dog grip and powerful leverage ... in the smooth efficiency that comes from correct design for every service operation. Snap-ons are the choice of better mechanics throughout industry. Write for catalog.

Snap-on Tools
THE CHOICE OF BETTER MECHANICS



SNAP-ON TOOLS CORPORATION • 8036-E 28th Avenue • Kenosha, Wisconsin

MAY, 1944

When writing to advertisers please mention Motor Age

63

Enemy Vehicles

(Continued from page 31)

2595, in operating condition on the top of a mountain at Attu and this tank is now at Aberdeen. This Japanese light tank weigh approximately 8 tons with plates from $\frac{1}{2}$ in. to $\frac{3}{4}$ in. thick. The tank is powered with the six-cylinder in-line Diesel air-cooled engine of sufficient power to give the tank excellent mobility and a maximum speed of approximately 25 m.p.h. Steering is accomplished by a clutch brake system.

One of the most recent vehicles to arrive at the Aberdeen Research Center is the Japanese 2½-ton truck. The six-cylinder gasoline engine is the L-head type with tappet covers on one side. A separate external drive with flexible couplings powers the generator, distributor, oil pump and in some cases the water pump. Ignition as usual is by Bosch. All the tandem rear wheels are worm-driven, with differential housings stabilized from a tubular cross member in the frame. This is a purely German design. The wood body is provided with steel reinforcing ribs. At the rear short semi-elliptical springs are used

to cushion the shock on the pintle.

The Japanese tractor is a light-weight prime mover designed for towing light artillery and transporting the gun crew of six. It is powered by a six-cylinder in-line gasoline engine, with power take-off for the worm-driven winch mounted in the rear. Eight pairs of steel flanged bogie wheels provide undulation for the suspension. The tracks are 10 in. wide. Ground contact is about 7 ft. This vehicle has a speed of 10 m.p.h.

In this war, the Germans are the leaders in the half-track field. They have produced a wide range of vehicles, from a 1-ton for use with infantry to the large 18-ton vehicle for hauling the heavy types of German army artillery. There are six types of these vehicles: 1-ton, 3-ton, 5-ton, 8-ton, 12-ton and 18-ton. Perhaps, more accurately, these vehicles should be called $\frac{3}{4}$ -tracks, because the track has been lengthened by bringing the front-drive sprocket up as close as possible to the front wheel. This has the advantage of making it nearly impossible to hang up the vehicle by ground interference with the body between the front wheel and the track.

The 1-ton half-track vehicle is used to carry infantry troops and also for drawing light infantry howitzers and light anti-tank guns. The 3-ton half-track vehicle carries a 1½-ton payload in the body and is likewise designed to haul a trailer load of 3 tons. The 5-ton German half-track vehicle carries a payload of 1½ tons and is capable of hauling an additional trailer load of 5 tons. The 8-ton vehicle is the universally used half-track. It can carry a payload of about 2 tons with an added trailer load of 8 tons. The payload of the 12-ton half-track is 3 tons and the trailer load is 12 tons. The 18-ton German half-track vehicle carries a 4-ton payload and can pull a trailer load of 18 tons.

German half-tracks are steered by the combined action of turning the front wheels and braking the rear track on the inside of the turn. The steering brake drums are carried on the final drive shafts between the gear box and the driving sprockets. Operation of the brakes comes into play at 18 degrees turn or approximately two-thirds full cut of the front wheels. In the full-cut position of the front wheels, it was found by experiment that the braked sprocket completed 15 revolutions to every 20 revolutions of the unbraked sprocket. The controlled differential allows all of the power to be applied to the sprockets.

The tracks on the German half-track vehicle are the best type produced by the Germans. It has a cast-steel frame to which replaceable rubber pads are bolted. The track pins turn on needle roller bearings which are protected by special rubber seals. This needle-bearing track gives

(Continued on page 66)





YESTERDAY
... For the past quarter of a century U. S. Air Compressor Company has pioneered in the automotive equipment field and during that time brought out many innovations in modern automotive equipment. They were always a step ahead of the field because they were thinking, planning and designing ahead of the times.

TODAY... U. S. Air Compressor Company is working day and night for Uncle Sam. Our past experience manufacturing quality automotive equipment has stood us in good stead as we are turning out precision war work in a way that has merited high approval by the government.

TOMORROW... You may again expect something new and modern in U. S. Air Compressors, lifts and lubricating equipment. Our postwar work is extremely promising and rest assured that something new will be added to the nationally famous U. S. Line.





AIR COMPRESSOR CO.

5300 HARVARD AVENUE • CLEVELAND, OHIO

AIR COMPRESSORS • HYDRAULIC LIFTS
LUBRICATING EQUIPMENT

For Quick, Safe, Smooth Stops

Wagner
CoMaX
BRAKE LINING



WAGNER
Automotive Products Include:
LOCKHEED
HYDRAULIC BRAKE FLUID
LOCKHEED
HYDRAULIC BRAKE PARTS
CoMaX
BRAKE LINING
WAGNER
AIR BRAKES
TACHOGRAPH
(Recording Speedometer)

CoMaX

the extra-life

BRAKE LINING

wears longer... guards life of vehicles

YOU'LL make no mistake by standardizing on CoMaX—the extra-life brake lining. It's great for cars, trucks and buses. Thousands of users agree that CoMaX can't be beat for quick, safe, smooth stops.

CoMaX has reinforced backing which permits deep seating of rivets, thus extending the period of safe usefulness.

Then, too, CoMaX is non-compressible, uniform in texture, easy on drums, and is age-proof.

Produced in rolls, sets, blocks and slabs. For details, consult your nearest Wagner jobber, or write us.



FOR VICTORY—BUY U. S. WAR BONDS and STAMPS



B44-3

Wagner Electric Corporation

ESTABLISHED 1891

6498 Plymouth Avenue, St. Louis, 14, Mo., U. S. A.
AUTOMOTIVE AND ELECTRICAL PRODUCTS

Enemy Vehicles

(Continued from page 64)

splendid performance with a rolling resistance of 43 lb. per ton of vehicle weight.

The larger of these vehicles has a dual fuel system. A small tank, located under the dashboard, contains high-volatility fuel for starting the Maybach gasoline engine. Immediately after starting, the engine is operated on the fuel from the main tank. Maybach engines of the six-cylinder in-line or twelve-cylinder V-

type are used for all half-track vehicles. Bogie wheels of the suspension systems are mounted in pairs on a forked axle, which is attached at the end of a beam pivoted at the other end. A leaf spring supports the load. At the rear, there is a trailing idler with a torsion bar suspension and means for adjusting the tension of the track.

These are military vehicles, engineered over many years, in which the key attribute is interchangeability. A minimum number of components have been used in the construction of all six vehicles of this class. Thus, the engines are all the same type—May-



"—and just as the Policewoman was going to give me a ticket Frank Sinatra came on the radio and she swooned."

How much does a year weigh?



Another year of hard, punishing service has been loaded on America's overworked rolling stock. In increased wear and depreciation . . . in manpower and parts replacement headaches . . . *you* know what another year weighs. And the only relief in sight is your vital repair and maintenance service. Lighten the load with better lubrication!

Fight
Friction
with

AMALIE

Pennsylvania
MOTOR OIL

GREATER OILINESS • HIGHER SLUDGE RESISTANCE • MORE GAS MILEAGE
MORE SATISFIED CUSTOMERS • GREATER STAYING POWER

Standardize on AMALIE LUBRICANTS, Too!

The AMALIE line gives you correct coverage of every vital lubrication point. For details see your AMALIE distributor or write us.

AMALIE DIVISION, L. Sonneborn Sons, Inc.
88 Lexington Avenue, New York 16, N. Y.
Refineries: Petrolia, Pa., and Franklin, Pa. • Plant: Nutley, N. J.
Southwestern Distributors: Sonneborn Bros., Dallas, Texas

P.G.C.O.A. Permit No. 12



Now More Than Ever—
It's AMALIE First . . .
Because AMALIE Lasts

Ask your AMALIE distributor—or write Dept. M-1—about new timely sales helps for you!

bach 6- and 12-cylinder, but of suitable size for the vehicles in each series. Likewise, the tracks are basically alike. This also applies to many other features in which a component part is made to interchange and no opportunity is lost in their designs to reduce the number of spare parts.

The German eight-wheeled drive reconnaissance car in its most usual form has approximately $\frac{1}{4}$ in. side armor. All eight wheels are independently driven and independently sprung, and all wheels steer. The mobility of this vehicle, while good in sand, is disappointing in mud. The Germans apparently have not found their eight-wheeler up to expectations, since it has been encountered in decreasing numbers in the more recent campaigns.

German motor cycles are very well engineered in all respects. The conventional military type of motorcycle with side car drives on both the rear wheels. Its attractive engine is manufactured by Bayrische Motorenwerke. The German half-track motorcycle weighs approximately 2700 lb. and has a combat crew of two men. Its maximum weight is 3400 lb. being designed for a payload of 700 lb.

The Panzer Kw III and IV were the principal tanks of the Germans in 1942 and 1943. Both weigh approximately the same, about 25 tons. It is interesting to note that the Germans have continued these models in use, but at the same time have improved them, year by year. Starting in 1936 with both models, there have been 19 principal modifications to the Kw III and 7 modifications to the Kw IV. In the case of the Kw III, the tank started off with a suspension that used coil springs. Then a change was made to semi-elliptic leaf springs and later, in place of two springs, three springs were introduced, and so on until in the fifth model the torsion-bar suspension was adopted.

(Continued on page 68)

THE NEWS ABOUT ANTI-FREEZE IS GOOD!

● The War Production Board has done a fine job in allocating anti-freeze materials for 1944-45. The total quantity of anti-freeze is ample for the *needs* of your customers and, therefore, for you.

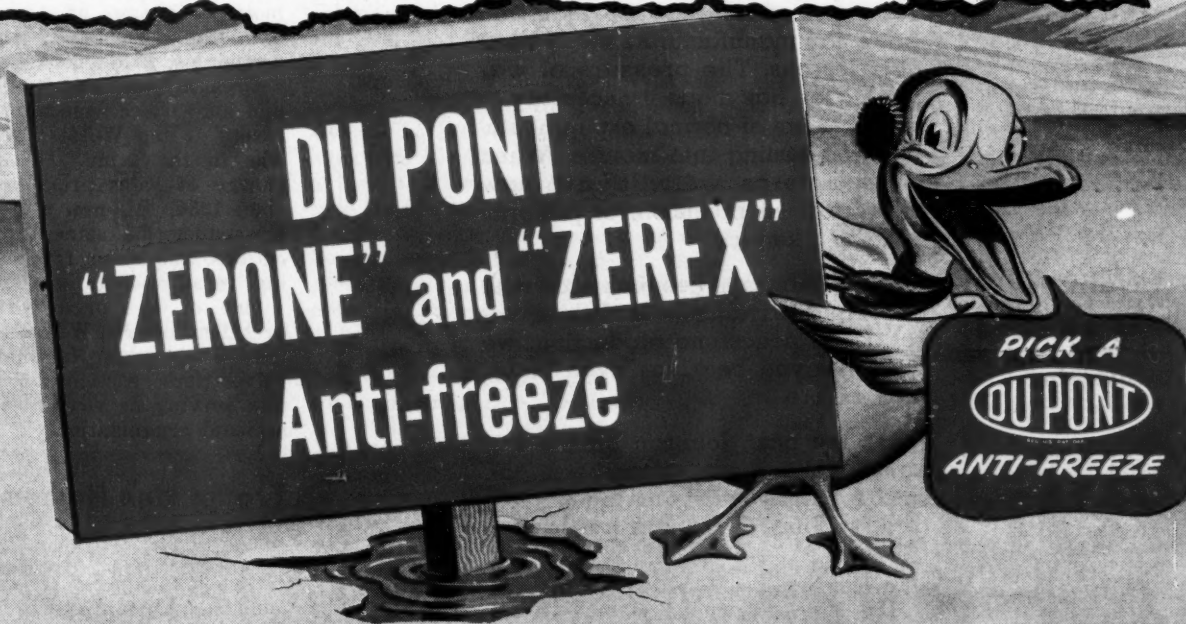
The job, from now on, is one of *distribution* rather than *supply*. A distribution plan is being worked out by the Anti-Freeze Industry Advisory Committee and the WPB, for states and cities.

This plan cannot guarantee that you will always be able to get all you want of a particular brand. However, it should assure all sections of the country receiving a total amount of anti-freeze sufficient for their real needs. To help make this plan work, you are asked to keep

your orders within reasonable limits.

And now a word of special interest to you who handle "Zerone" and "Zerex" anti-freeze. Not only will there be "Zerex" and War Emergency "Zerone," but regular "Zerone" will be on the market, too. Quantities of "Zerex" and regular "Zerone" will be limited. All three brands will be distributed in accordance with the official plan.

Thus, as part of the war effort, the task of keeping motor vehicle transportation rolling in cold weather is being taken care of. There is no need of panic buying or "pyramiding" of orders by the trade, or hoarding by the public. Distribution is being planned to take care of the *needs* of all.



BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Enemy Vehicles

(Continued from page 66)

The entire series of German tanks was equipped with Maybach engines. Six-cylinder engines of 100 or 140 hp., were used for the Kw I and II Tanks, and 12-cylinder V-engines of 320 hp. were used in the Kw III, IV and early V. V-12 engines of 650 hp. were used in the KwVI. In all the German tanks, the epicyclic type of steering, using the clutch brake principle, but without differential between the track drives, was employed. This steering, while

satisfactory, is not considered as good a steering mechanism as the controlled differential. As pointed out previously, the controlled differential was employed in the German half-track vehicles.

The steel tracks used on all German tanks consist of a common type of simple pin-jointed track. This track is strangely similar to the steel track employed in some American tanks up to about 1930. The Germans had an excellent needle-bearing track for their half-track vehicles and it is difficult to understand why this superior type of track was not employed for German tanks. Their tank track is good for

approximately 600 miles and has high resistance to traction, particularly at high speeds, as is the case of all tracks of this type. The Germans turned the disadvantage of having to frequently replace tracks into an advantage by carrying a generous supply of track shoes and piling these tracks up at the front and along the sides of the tank to give additional armor protection.

The Kw V is a new tank designed in 1939 which, to date, has been rarely seen on any battlefield. It is a larger tank than the Kw IV, weighing 36 tons. It also mounts a 75 mm. gun. This tank represents a redesign of the Panzer Kw IV and a step in advance of the latter. It is shown that the Germans have vigorously guarded the secret development of this tank. The latest modification is believed to be the German Panther tank, mounting a very high velocity 75 mm. gun and utilizing the engine, transmission, suspension and tracks of the Panzer Kw VI Tank.

The German Kw VI, also referred to as the Tiger tank, follows in general the basic German design for tanks, with engine in rear with transmission and drive sprocket in the front. The armor used on the sides is 3 1/4 in. thick. The overall weight of the vehicle is 67 U. S. tons. The gun mounted in the Mk VI tanks is the German 88mm. gun. The tank is watertight throughout and was apparently designed for crossing rivers in Russia.

This article is an abstract of the address which General Barnes delivered Jan. 12 at the War Engineering-Annual Meeting of the Society of Automotive Engineers in Detroit.



TESTING GROUND

for tomorrow!

Today's battlefields are teaching American manufacturers many valuable lessons. The pressure of war production has made it necessary to crowd years of normal experimentation and testing into months. When peace returns, we will have new standards of precision, of performance and service.

Johnson Bronze is keeping pace with this rapid advancement. When we return to peacetime production, we will give you bearings even better than before.

As in the past, Johnson Bronze will be a good name to remember in the future when you want the highest quality bearings and bushings.

*Have you
Bought a Bond
Lately?*

JOHNSON BRONZE
SLEEVE BEARING HEADQUARTERS
455 S. MILL STREET NEW CASTLE, PA.



Appointed Ad Manager

Edward V. Creagh has been appointed advertising and sales promotion manager of American Chain and Cable Co., Inc., and associate companies, Bridgeport, Conn.

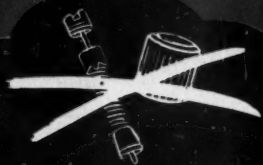
Creagh joined the company in 1916, and his service has been continuous, except during World War I, when he was in the army. He has been in charge of sales promotion activities since 1936. His new duties will cover newspaper, magazine, business publications, and other forms of advertising, in addition to sales promotion.

One of the organizers and first president of the Western New England Chapter of National Industrial Advertisers Association, Creagh is now serving as vice president of the national organization.

Traffic Men Named

R. M. Hollingshead Corp., Camden, N. J., manufacturers of automotive, household and industrial chemicals, announce appointment of James P. Reese as traffic manager and Walter H. Rickard as assistant traffic manager.

JENKINS HAS THE ANSWER



CAPLESS...PERMANENT CORE

Tube makers get completely assembled valve that saves installation time. Service people and car owners get relief from separate cap and core nuisance.



STANDARD SIZE INTAKE

Stem tip takes all standard inflation equipment — slip-on and screw-on. Threaded connections screw over rubber tip. No tools or attachments needed for maintenance.

TRouble-FREE

PLUG SEAT...RUSTLESS STEEL SPRING

Self-cleaning plug-type seat guarantees a permanent seal. Integral stainless steel valve spring defies corrosion.



TRULY FLEXIBLE

Only flexible valve on the market. Stem recedes through rim hole in case of flat. No "rubber coated" rigid thumb to rip tube.

TO LONGER TIRE LIFE!

IT'S THE JENKINS CAPLESS TIRE VALVE . . . THE POSITIVE, SELF-SEALING, NUISANCE-FREE VALVE THAT ADDS MILES TO SCARCE TIRES BY MAINTAINING PROPER PRESSURE!



GUARANTEED FOR TUBE LIFE!

Every Jenkins Capless Tire Valve is guaranteed Air-Tight for the life of the tube to which it is originally attached!

There's never been a time when car owners were so "tire conscious" as they are *right now*. Never a time when Americans were so receptive to *tested* methods of stretching their rapidly aging rubber to its last possible mile. The Jenkins Capless Tire Valve, with its road-proved ability to maintain correct tire pressure under every driving condition, is "made to order" for this ready-made market!

Unique in design, the Jenkins Capless Tire Valve embodies the "plug-seat" principle long recognized by industrial valve

engineers as the simplest, surest method of obtaining a leakproof seal. This plug-type seat is so tight that no auxiliary cap is needed to prevent leakage and keep out dirt. And with no cap to lose . . . no core to wear or loosen . . . car owners and service men are freed from a pesky nuisance!

Jenkins Capless Tire Valves have been proved on millions of tubes in actual service. Whether you make tubes or market them, you will find it profitable to get the full story from — Jenkins Bros., Tire Valve Div., 80 White St., New York 13, N. Y.

JENKINS Capless TIRE VALVE

SEALS AIR IN



SEALS DIRT OUT

MADE BY JENKINS BROS...MAKERS OF FAMOUS JENKINS VALVES

2 Named Vice-presidents

At the recent meeting of the board of directors following the Corporation's annual meeting, R. T. Dunlap and E. F. Early were elected vice presidents of the Wickwire Spencer Steel Co.

Dunlap was previously assistant to the president and for the past several months has been acting in the capacity of general superintendent at the company's Buffalo plant.

Early has long been associated with Wickwire Spencer, is general superintendent at the Morgan plant of the company in Worcester, Mass.

This division manufactures springs, formed wires and bright wire goods, and is one of the most efficient operating units.

Locates Permanently

George W. Mathews, Brunner Manufacturing Co. New York district manager, who has been operating from temporary quarters since his recent appointment, is now permanently located at 340 West 57th street, New York, according to an announcement to the trade by B. J. Scholl, sales manager.



H. C. Doss

Doss Heads Nash Sales

H. C. Doss has been appointed a vice president of Nash-Kelvinator Corp. in charge of sales for the Nash Motors Division, it was announced last month by George W. Mason, president.

In his new position as general sales manager, Doss succeeds L. S. Skutt, who resigned last week to take a franchise for the Denver territory for Nash cars and also for Kelvinator appliances.

Doss comes to Nash after 27 years with the Ford Motor Co. Since joining Ford in 1916, Doss has managed sales and assembly plant operations in Oklahoma City, Kansas City, and Edgewater, N. J. After three years in Detroit as assistant general sales manager, Doss resumed his Kansas City post and in 1938 assumed similar responsibilities at the Ford plant in Chicago. A year later, he was appointed general sales manager with headquarters in Detroit.

According to the statement issued by Mason, Doss will assume his new post immediately and carry on with the plans already under way to advance the position of Nash in the post-war market.

Returns To Timken

James F. Reid, former Deputy chief of the Alloy Steel Branch of the WPB, has been appointed production manager of The Timken Roller Bearing Co. of Canton, Ohio. Reid had been production manager of the Steel and Tube Division of the Timken company before obtaining a leave of absence in May, 1942, to join WPB as chief of the Alloy Steel Section. His activities and responsibilities in this new capacity extend to all divisions of the company.

Reid first joined the Timken company 25 years ago as an employee in the production department, becoming, 10 years later, production manager of the Steel and Tube Division.



TESTED • PROVED • IMPROVED
ON OUR OWN
PRODUCTION LINE!

LEMPCO

DESIGNERS • MAKERS • USERS
OF
MACHINE SHOP EQUIPMENT

PRESSUREMATIC POWER PRESSES

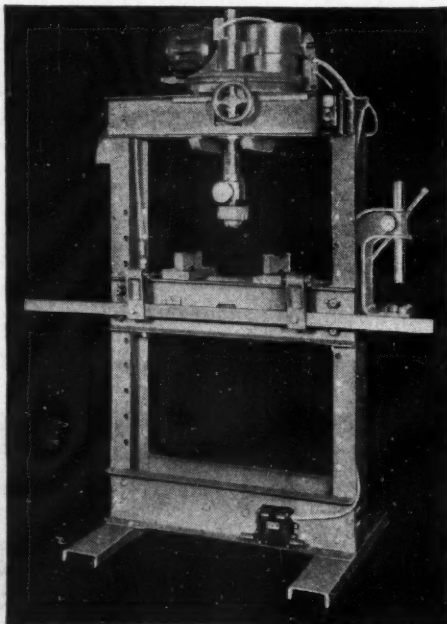
Pay for themselves many times over in automotive maintenance shops. For straightening, bending, press-fits. Used extensively on production lines in the greatest aircraft and tank factories in the world! Many exclusive features. There's a model to fit your needs and your pocketbook.

- ★ 60 tons in 4 seconds
- ★ Electric & Hydraulic
- ★ 20, 40 & 60 Ton Models
- ★ Automatic Pressure Control

WRITE FOR SPECIFICATIONS

LEMPCO

5727 DUNHAM RD. • BEDFORD, OHIO

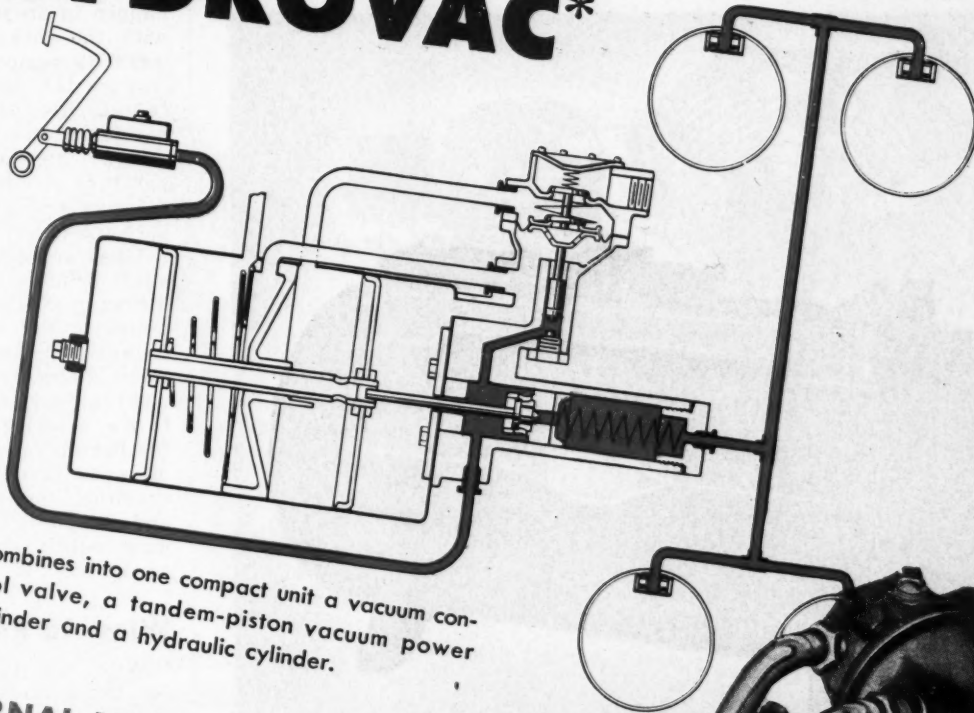


CEILING-PRICED!

a *Simpler System*

FOR
POST-WAR VACUUM POWER BRAKING

HYDROVAC*



Combines into one compact unit a vacuum control valve, a tandem-piston vacuum power cylinder and a hydraulic cylinder.

NO EXTERNAL LEVERS OR MOVING PARTS



- Easy to Install
- Easy to Service
- Can Be Located Any Place on the Chassis

NEW, BUT PROVED . . . Over one-half million Hydrovacs are now in use from the tropics to the arctic on allied military vehicles... Because of these millions of miles of war-use, the Hydrovac is without doubt *the best proved new* product ever offered the automotive manufacturing and service trades.

Simple . . . Efficient . . . DEPENDABLE.

NOW AVAILABLE for prompt delivery to qualified wartime users. See your Bendix B-K dealer or write the factory direct.

BENDIX PRODUCTS DIVISION, South Bend, Indiana

*Hydrovac" and "B-K" are trademarks of Bendix Aviation Corporation



Cylinder Wear

(Continued from Page 26)

3. Adequate lubrication of cylinder bores.

4. Complete control of lubricant at the piston rings, not at the source of supply.

5. Control of blow-by at the piston ring.

Failure of any of these control factors will result in accelerating the rate of corrosion.

Engines which are started in a warm garage on an average of once

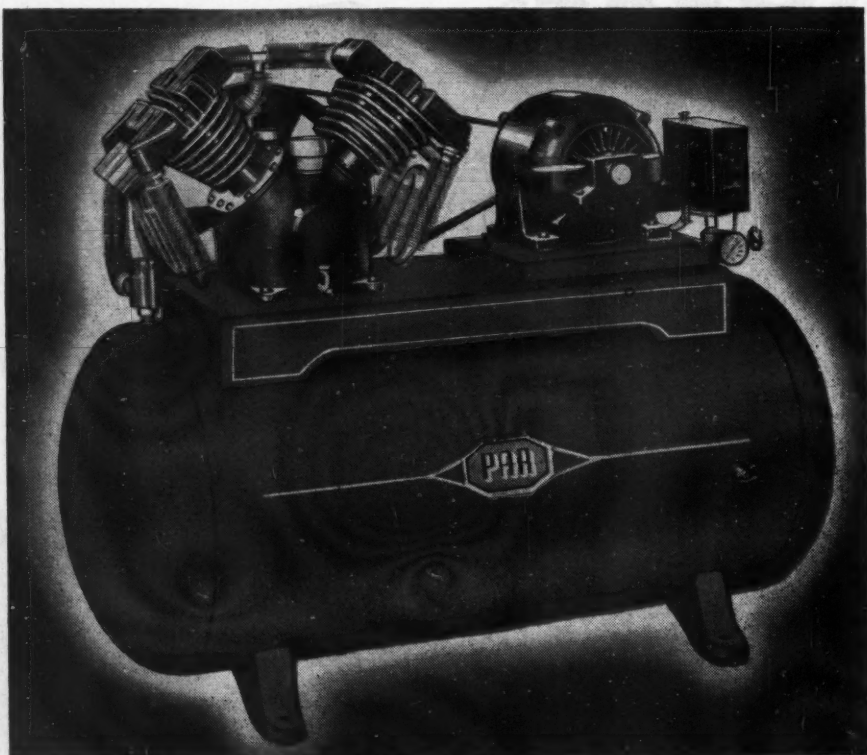
every 50 to 100 miles show a bore wear of approximately .001 in. in 2,500 miles. In comparing bore wear on various makes of American engines, two makes showed the wear rate to be twice as good as the average and one make to be twice as bad as the average. Taub stated that only one design feature was common to the two engines that showed the lowest rate of bore wear, which was heavy splash lubrication. The engine which showed the greatest bore wear had a very short piston, making it difficult to have good oil control from the rings, and a crankpin construction giving very little oil throw-off

due to the use of a peculiar type of rod bearing. Consequently the bores received very little lubrication. This indicates that adequate lubrication of the bores is necessary to insure a low rate of wear.

Another factor which is thought to affect bore wear is carburetion. In the part-throttle range, mixtures of 12 to 1 and 14 to 1 may result in bore wear of three to seven times normal. The rich mixture further dilutes the oil film, which is already weak at the top of the cylinder bore. Most corrosive wear occurs at part throttle, as the internal heat of full throttle raises the metal temperature above the active range of the acids formed during combustion. It is easily seen what will happen in an engine that is operated with the choke on after the initial warm-up period.

Since the acids produced by combustion are active at certain temperatures and relatively inactive at others a high and uniform wall temperature should be included in any list of factors essential to low-rate bore wear.

There are many other factors which affect cylinder wear. One in cylinder distortion. Mechanical distortion is prominent in L-head engines due to the clamping action of the cylinder head. Taub stated this type of engine is also subject to heat distortion due to the exhaust-port location close to the barrels, and frequently to a lack of water around the barrels. This condition tends to produce blow-by and excessive pressure behind the top ring, which accelerates the rate of wear.



PAR MODEL 30

● A natural for stations and shops operating a multiple of pneumatical equipment.

● A Heavy Duty 3 H.P. two stage 4 cylinder compressor equipped with 80 gal. tank.

● Also available in 5 H.P. model.

● Write for illustrated brochure of details.

● BY COMPARISON—YOU'LL BUY PAR.

PAR

DIVISION

LYNCH MANUFACTURING CORPORATION
DEFIANCE, OHIO, U. S. A.

Wins Ad Recognition

With "the job that has been done for the nation at war" as its chief criterion, the administrative board of the annual advertising awards recently selected the 100 most outstanding ads of 1943. Nash-Kelvinator Corp., whose ad, "I'm Not Playing for Marbles," shared in the award.

This Nash-Kelvinator ad was twice read into the Congressional record. It told of the hopes of G. I. Joe for the tangible kind of world for which he risked his life.

To-date, the company has drawn requests for more than 250,000 reprints of the various "inspirational" ads included in the Nash-Kelvinator series.

Managers Named

Elmer A. Muhs, who was formerly War Housing Center manager in Reading, Pa., has been appointed manager of purchases and priorities. and Norman E. Clock, formerly a casting director for Paramount Pictures, has been appointed personnel manager for the Bowers Battery and Spark Plug Co., according to an announcement made by Clarence P. Bowers, president.

Back on Patrol

weeks Ahead of time
because of **SEVEN LEAGUE BOOTS!**

A Navy Patrol Boat reaches a Naval Base with a badly battered connecting rod throw! A new crankshaft will take too much time! Require weeks to secure, and necessitate the dismantling of the ship's superstructure!

A call goes out to a nearby Automotive Wholesaler whose stock of parts and machine work has met many an emergency call from the Base! With him he brings his "Know-How" and a grinding specialist to the ship! For three days they stay with the job...work with the Navy Yard machinists...the problem is solved...the ship sails again in ten days' time!

★ ★ ★

Like the storied Seven League Boots that almost immediately brought their wearer wherever needed, the facilities of the Automotive Wholesaler have provided the Nation with an indispensable, immediate, on-the-spot source of Know-How, Machine Shop Facilities and Service Stocks of Parts, Equipment and Supplies. This is one of a series depicting how these services have been and are being utilized by Army, Navy, War Industries and the Automotive Service Industry to speed Victory. A BOOKLET DETAILING THE VITAL SERVICES BEING RENDERED TO THE NATION BY THE AUTOMOTIVE WHOLESALER will gladly be sent you upon request to **The MOTOR AND EQUIPMENT WHOLESALERS ASSOCIATION, 309 WEST JACKSON BOULEVARD, CHICAGO 6, ILLINOIS.**



Buy With Confidence Where You See This Insignia!

Buy More War Bonds



Copyright 1944 M.E.W.A.

Window Regulators

(Continued from page 33)

vided with a threaded connection spud at the bottom. When making a connection to this spud, it should be held with a wrench, as any twisting of the spud will cause it to leak fluid. The piston is connected to the piston rod through a calibrated compression spring to compensate for expansion of the fluid in the cylinders with the windows closed. Proper spring strength is very important and should only be replaced with a spring of the correct

tension. The piston-sealing ring is a special grade of rubber and must be replaced with a ring of the same type. If the piston is removed from the cylinder, 1 oz. of fluid must be poured on top of the piston after it has been reassembled to the cylinder to lubricate the upper portion of the piston. Do not damage the piston rod boot when disassembling the cylinder.

When any control switch fails, the complete unit must be replaced. Be sure that all electrical connections are clean and tight. If installation of a new switch is necessary, make certain that the switch knob is properly centered in the escutcheon plate and that the

switch returns to the center position without binding or sticking.

The fluid reservoir should be checked regularly and kept filled with standard hydraulic brake fluid. When checking the fluid level in the reservoir, all windows must be in the fully lowered position, as the reservoir is only partially filled when the windows are raised. No mineral oil should be allowed to get into the system under any circumstances. All parts must be washed in alcohol, not gasoline. The serviceman's hands should be washed thoroughly with soap and water before handling any parts.

When replacing a door glass, it should be determined that it moves freely in the channel before the piston rod is attached to the regulator arm. Any tendency to bind should be corrected by vertical adjustment of the regulator-arm pivot stud in the slotted hole.

When the window is in the fully lowered position, it is supported by the piston resting on the bottom of the cylinder. This adjustment is accomplished by screwing the piston rod in or out of the connector rod until the correct adjustment is secured and then locked by tightening the lock nut. When making this adjustment, be careful not to damage the rubber boot or allow any foreign matter to fall into the upper end of the cylinder. Be sure that the washers are in place to prevent the connector rod from becoming disconnected from the regulator arms.

Be sure to disconnect one side of the battery before taking off any fluid lines in the system, as accidental movement of any control switch may cause damage to the parts or result in fluid being forced out onto the upholstery.

LOST EFFICIENCY RESTORED

HIGHLIGHTS IN THE HISTORY OF SPECTACLES

The use of lenses as an aid to eyesight started about 1260 when Roger Bacon, English scientist, discovered that a piece of curved glass produced a magnified image.

A portrait of an Italian cardinal, painted in 1352, showing two lenses crudely joined, is the first recorded picture of a pair of spectacles.

In medieval times few persons could read. With the invention of printing, a demand for spectacles was instantly created.

Astigmatism was first recognized about 1825. This marked the beginning of lenses specially ground to meet the needs of the individual.



OPTICAL science has made such amazing advances during the past few years that eyeglasses not only restore impaired sight to normal but often enable the wearer to see better than ever before.

Just as eyeglasses give back to failing vision what it has lost, so Hygrade Replacement Parts—engineered to tolerances for OLD UNITS—restore Carburetors and Fuel Pumps to their original efficiency.

Available in the famous Hygrade Contain-All Kits, for practically all Carburetors and Fuel Pumps in use today.

HYGRADE PRODUCTS CO., INC.
35-35 Thirty-fifth Street
Long Island City, N. Y.

Replacement Parts for Carburetors, Fuel Pumps, Speedometers and Shock Absorbers, Fuel Lines and Fittings.

Hygrade Fine AUTOMOTIVE PRODUCTS

HYGRADE

Don't BUY Labor - SELL it!

Theodore G. Joslin

Theodore G. Joslin, director of public relations, E. I. du Pont de Nemours & Co., and secretary to President Hoover during his term in the White House, died at Wilmington, Del., April 12, after a heart attack. Stricken in his office shortly after arriving for the day, he died an hour later. He was 54.

A noted Washington correspondent for newspapers and national magazines, Joslin left the journalistic field five years ago to head the Du Pont Public Relations Department. Since joining the company, he had appeared frequently as a speaker.

A native of Leominster, Mass., he began his newspaper work with the Associated Press in Boston in 1908. Following the 1916 election campaign, he joined the Boston *Transcript's* Washington Bureau becoming its chief in 1923; and in 1926 was made the paper's national editor.

From March, 1931, until March, 1933, Joslin served as secretary to President Hoover. He was appointed to the Du Pont Company post in 1939.

AUTO-LITE

Wire AND Cable

meets every need for

- ✓ SPOOL WIRE
- ✓ IGNITION CABLE SETS
- ✓ BATTERY CABLES

The Auto-Lite wire and cable line is a complete line, gives you the exact type needed on every automotive wiring job. Here are some of Auto-Lite's outstanding features:

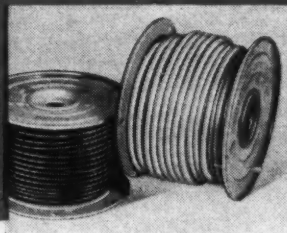
NO-CORRODE TERMINALS last longer, perform better than old style terminals. "Bumper block" tightens completely on any size battery post.

FULL SIZE BATTERY CABLES use only full No. 1 and No. 0 gauge conductor. Don't starve the starter—install Auto-Lite.

AUTO-LITE'S FAMOUS STEELDUCTOR CABLE is now available in automotive type for car, truck and tractor use.

Ask your distributor or write to

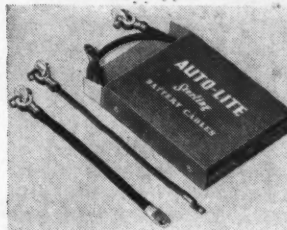
THE ELECTRIC AUTO-LITE COMPANY
TOLEDO, 1 OHIO
Merchandising Division



Stainless steel High Tension cable and copper cable



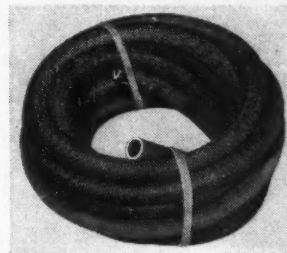
Ignition sets in stainless steel and copper



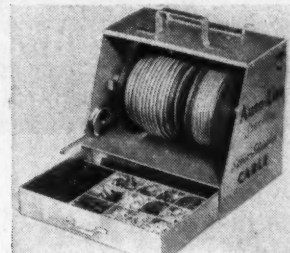
Ground straps and battery cable



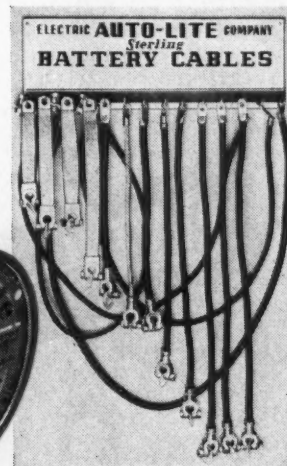
Primary wire in various sizes



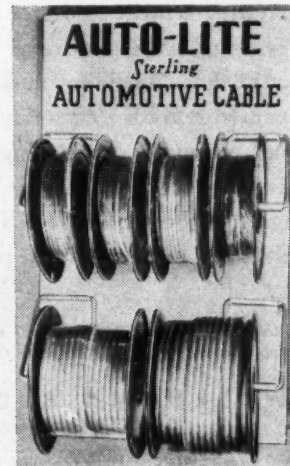
Loom in various sizes



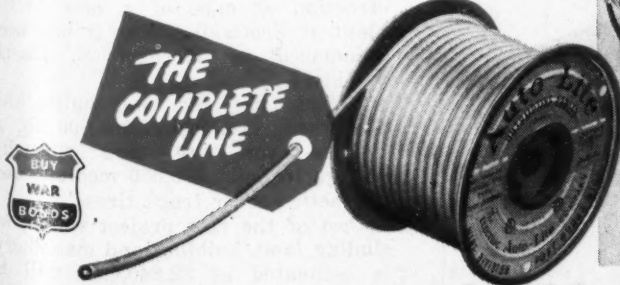
Combination wiring kit



Battery cable assortment



Spool cable assortment



TUNE IN "EVERYTHING FOR THE BOYS" STARRING RONALD COLMAN—EVERY TUESDAY NIGHT—NBC NETWORK

Change in L-158

(Continued from Page 19)

under the Controlled Materials Plan. The new order would permit them, if they chose to slash their civilian production to 5 per cent of the total, although this is not the intent of the amendment and probably has not entered the head of any manufacturer.

If application of the new civilian quota would interfere with a plant's ability to meet military demands, the plant is to notify the Automotive Division of the WPB, which will con-

sider adjustments of the plant's quota.

Anything that will increase production of parts for civilian trucks and buses is welcomed by the industry and the public. But the cross talk of different departments so painfully apparent in the L-158 amendment, is no assurance that parts production will be increased, except possibly in the factories devoted 100 per cent to war production.

However, reports from Detroit, saying that car factories have been allowed to reinstall production lines for producing replacement parts, such as crankshafts, should ease the shortage of the most critical items.



**tools
step
up
the
pace**

Mass production techniques used in the speedy fabrication of airplane, tank, and truck assemblies require tools of high precision and unerring accuracy. Such are the tools that Williams make . . . sturdy, dependable tools that today help turn out and maintain devastating fire-power. After victory, Williams Tools will turn again to the production of finer cars, trucks and other products for peacetime living.

"How to Select and Use Wrenches" gives many pointers which you will appreciate. Write for it.

J. H. WILLIAMS & CO.
BUFFALO 7, NEW YORK

DROP-FORGINGS & DROP-FORGED TOOLS



Plug Sales, Grant Urges; Production Must Follow

POST-war plans should be based upon the ability to sell goods to the public, not the ability to produce them, Richard H. Grant, who recently retired as vice president in charge of sales for General Motors, told the Adcraft Club of Detroit recently. Grant was guest of honor at a banquet marking his retirement. Selling comes first and production afterwards, Grant asserted, so the prime emphasis should be placed on sales rather than production. Grant also recited the history of dealer cooperative advertising when he was sales manager of Chevrolet, and predicted that it would continue for at least another 20 years.

Grant was presented with an honorary life membership in the Adcraft Club by Henry T. Ewald, president of Campbell-Ewald Co., Inc., Detroit advertising agency, and founder of the club. Ewald himself is the only other honorary life member. Many of the top executives in the automobile industry attended the banquet, including C. E. Wilson, president of GM; H. H. Curtice, general manager of Buick; Nickolas Dreystadt, general manager of Cadillac; A. vanDerZee, vice president of Chrysler Corp.; H. G. Little, director of advertising for Nash; Senator Homer Ferguson, and many others.

Ford II Advanced

Henry Ford II, grandson of Henry Ford, has been elected executive vice president of the Ford Motor Co. This is the second promotion since the first of the year for the younger Ford. Previously he had been made vice president of the company in charge of sales. In his new post, he will presumably exercise authority second only to that of his grandfather, who last year resumed the presidency.

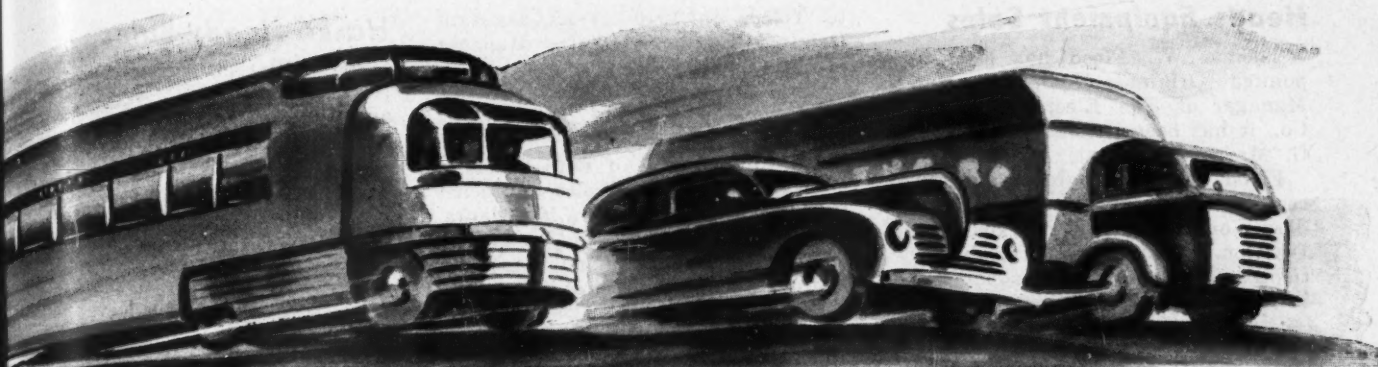
It was announced at the same time that Joseph Calamb, who had been chief of the body-engineering department, had resigned. He was succeeded by E. T. Gregorie.

Starts Rayon-Cord Plant

To help meet the nation's wartime need for more rayon tire cord, United States Rubber Co. will begin construction at once of a new textile plant at Scottsville, Va., it has been announced by Herbert E. Smith, president.

"When completed," said Smith, "this plant will produce 12,000,000 lb. of twisted-rayon tire cord annually, enough to build 600,000 medium-sized synthetic-rubber truck tires."

Cost of the new project which, including land, building and machinery, is estimated at \$2,240,000, will be financed by the Defense Plant Corp.



AUSCO'S Post-War *Hydraulics*

Your Customers may be entitled to Buy Them Now!

Streaming out of the plants of the Auto Specialties Company today are many materials of war . . . among them Hydraulic Jacks of advanced design for military use.

Military requirements now permit that some of these Battle-Tested Jacks with their many advanced post-war features

can be made available to your customers.

You'll find these Ausco Hydraulics will exceed your every expectation . . . in power . . . capacity . . . ease of operation and dependability! *Auto Specialties Mfg. Co., St. Joseph, Michigan; Windsor, Ontario.*



Watch **AUSCO**
for the Latest in Jacks

FOLLOWING IS A PARTIAL LIST OF WAR MATERIALS AUSCO IS HELPING TO PRODUCE:
Ordnance Ammunition Steel Castings ☆ Armor Piercing Shell ☆ Trench Mortar Bombs
Complete Tracks for Tanks and Combat Vehicles ☆ Hydraulic and Mechanical Jacks

Heads Equipment Sales

Thomas W. Flood has been appointed Original Equipment Sales Manager of The Electric Auto-Lite Co., it has been announced by Royce G. Martin, president.

Flood joined the automotive industry following service overseas in the first World War with the famed 77th Division. While in the Army he participated in four major engagements including the two Argonne drives.

In 1936, he was named Auto-Lite Original Equipment Sales Manager for the Chicago territory, returning

to Toledo in 1940 as an assistant Original Equipment Sales Manager of the Company.

Takes Over Region

The appointment of Paul Sever as manager of the Chevrolet Southeast Region with headquarters in Atlanta, Ga. has been announced by W. E. Holler, general sales manager, Chevrolet Motor Division of General Motors.

Sever succeeds L. S. Costley whose death occurred recently. Prior to his appointment, Sever was assistant regional manager in Atlanta.

Haske Heads Sales

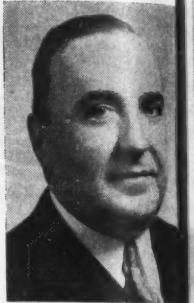
H. B. Barrett, president of Barrett Equipment Co., St. Louis, Mo. announces the appointment of Frank J. P. Haske, as general sales manager.

Probably one of the best-known men in the automotive industry, Frank Haske brings to Barrett, a thorough and practical knowledge of jobber problems.

Haske originated the Automotive Equipment Plan with the Commercial Credit Co. In 1942, he was with the WPB Automotive Division, and after completing this assignment, he was automotive consultant to the ODT.

Barrett also announces the promotion of Cliff S. Garstang, to director of sales and service of all national accounts. He has been assistant sales manager and assistant secretary of the company for four years.

Tom W. Moss, has been appointed automotive consultant, to make a survey of the trends of the automobile manufacturers post-war service maintenance planning for Barrett.



Frank J. P. Haske

Named Chief Engineer

Lloyd H. Scott has been named chief engineer of the Eisemann Corp., Brooklyn, N. Y., manufacturers of magnetos, generators, ignition, and fuel-injection systems, according to an announcement by John A. Seubert, president.

Scott had previously served as chief engineer of the Airward Division, Eisemann Corp., and as secretary of the Airward Corp. during its existence. He was research engineer for Scintilla Magneto Division, Sidney, N. Y., from 1934 to 1940 and earlier was test engineer on all types of electrical equipment for General Electric Company, Schenectady, N. Y.

H. R. Metz has been appointed as work manager in charge of all Divisions. During the last two and one-half years, Metz has been engaged in starting major defense projects among which was the new Diesel fuel injector plant of American Bosch Corp., Providence, R. I., where he was works manager.

Acquires New Building

The acquisition of another new factory building is announced by Felt Products Mfg. Co., Chicago, makers of gaskets, packings and other sealing materials.

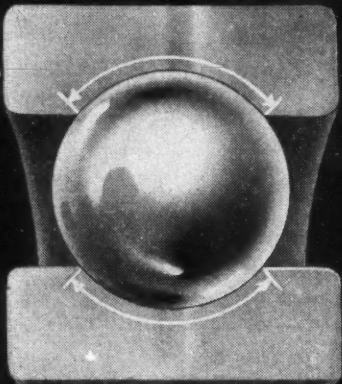
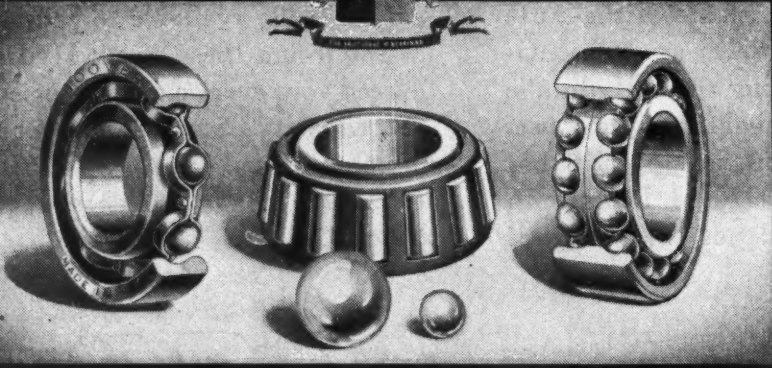
The new building, which will be an addition to the plant buildings already occupied, is a two-story structure with 125 ft. on Fulton St., 200 ft. on Carroll Ave., and occupying the entire block on Sheldon St.

HONED RACEWAYS

AN EXCLUSIVE HOOVER FEATURE

30%

MORE LOAD—LONGER LIFE

BALLS - BALL BEARINGS - ROLLER BEARINGS

H O O V E R

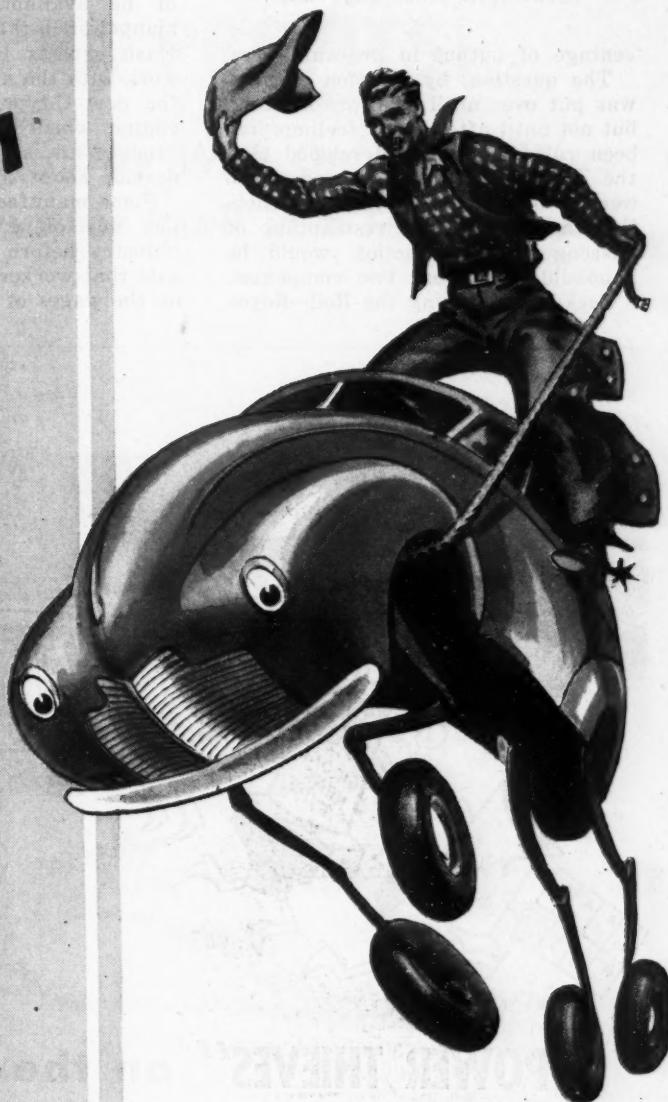
BALL AND BEARING COMPANY, ANN ARBOR, MICHIGAN

MOTOR RYTHM MAKES THAT ORNERY CAR BEHAVE!

Keeping engines free of carbon, gum, sludge, and varnish is an important part of Preventive Maintenance! MOTOR RYTHM gets rid of these harmful, power-wasting deposits the modern, practical way—*chemically*.

MOTOR RYTHM is a liquid chemical developed in the famous Hollingshead laboratories. Added to gasoline and oil, it dissolves carbon binders . . . frees sticking valves and rings . . . stops bucking and ping due to carbon . . . guards engines against internal rust and corrosion.

A clean engine starts quicker; runs better; retains much of its original power and pep . . . saves money on fuel and repairs! That's why motorists want MOTOR RYTHM! Powerfully advertised. Complete, attractive displays and point-of-sales material available. Order from your jobber. *R. M. Hollingshead Corporation, Camden, New Jersey; Toronto, Can.*



BUY MORE BONDS!

Hollingshead
LEADER IN MAINTENANCE PRODUCTS



Other popular WHIZ reconditioning products: VENUS POLISH • INSTANT SEALER • RADIATOR CLEANER • COMMANDO RUST PREVENTIVE • BRAKE FLUID • HO-ZOF DEGREASER



Repair Parts

(Continued from page 23)

centage of output in pre-war years.

The question, by common consent, was put over until a future meeting, but not until after a few feelings had been ruffled. Also, it developed that the Packard Motor Co. and Nash were so bound up with war contracts that any immediate resumption of passenger-car production would be impossible for these two companies.

Packard is making the Rolls-Royce

engines and PT boats, and Nash is making Pratt and Whitney airplane engines. Both companies have little or no available idle capacity and manpower in their areas is very tight. Nash expects to get increased war work with the award of contracts for the new C-type Pratt and Whitney engine, which involves new tooling to produce an engine which is said to develop about 2600 hp.

Some manufacturers feared a serious unemployment situation in the industry before 1944 is out. Wilson said that workers could not get along on the wages of a 40-hour week with

increased taxes and higher living costs.

James H. Marks, vice-president of Packard, said that he felt that increasing cutbacks would cause the development of a manpower surplus "much sooner than most people think." Marks pointed out that the desire of workers to be retained in their jobs while the industry was being cutback would increase productive efficiency and contribute to greater lay-offs.

Manufacturers expressed indignation over the government's lack of a policy for getting government-owned machinery and materials out of the company plants, and said that one of the first policies laid down should be one governing tools and machinery, including both the question of releasing government-owned equipment and the question of placing orders now for new tools.

On the question of experimental work on new tools, fear was expressed that companies could not retain workers employed for a civilian purpose. It was questioned how companies could tell draft boards that men working on goods for civilians were necessary to the war. This points to the need of a new manpower policy to clear the question up.

Attending the meeting with WPB and Army officials, were the following:

C. E. Wilson, president, and Albert Bradley, vice-president of General Motors; Ward M. Canaday, president, and Delmar G. Roos, vice-president of Willys-Overland; Henry Ford II, vice-president, and R. R. Rausch, vice-president of Ford; Powel Crosley, Jr., president, and R. C. Cosgrove, vice-president of the Crosley Corp.; George W. Mason, president, and A. M. Wibel, vice-president of Nash-Kelvinator; A. E. Barit, president, and S. G. Baits, vice-president of Hudson; K. T. Keller, president, and B. E. Hutchinson, vice-president of Chrysler; J. H. Marks, vice-president of Packard; and Paul G. Hoffman, president, and Courtney Johnson, assistant to the chairman of the board of Studebaker.

The need for increased legislative authority for WPB became apparent when automobile men were requested to return to WPB within 60 to 90 days for a second meeting with plans for restricted production and subsequently for unlimited production. The plans are to include data on the need for new machinery, plant space and manpower, the number of government-owned tools which must be disposed of by each manufacturer and those which each company wishes to retain. Automobile leaders were furnished also with information on what contracts should be shifted out of the Detroit and other car-making areas.

C. E. Wilson, president of the Gen
(Continued on page 84)



"POWER THIEVES" on the loose! —you can help stop 'em

Every time a dirty, worn or improperly gapped spark plug misfires, precious gas is wasted! You can help stop this waste by selling *regular* spark plug check-ups to every customer. Lots of times a plug check will suggest other service, too. When new plugs are needed, suggest Edisons—correctly engineered to get maximum power out of every drop of fuel. The "greatest name in electricity" helps sell Edisons for you.



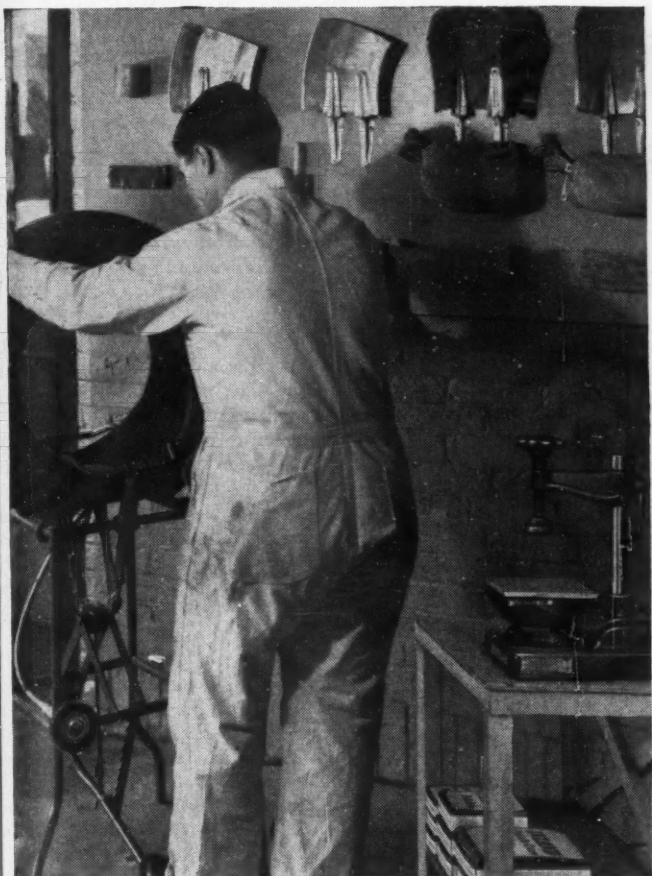
Edison

SPARK PLUGS

EDISON-SPLITDORF CORPORATION, WEST ORANGE, N. J.

INLAND'S NEW TIRE SECTION REPAIRS BRING IN EXTRA PROFITS!

You Can Make \$15.00 Profit a Day With Only 2½ Hours Work. Inland Equipment Pays for Itself in a Few Weeks!



REPAIRS SPOTS, SECTIONS AND TUBES

This revolutionary new Inland Complete Tire Repair Unit makes it possible for you to handle any tire up to 7.50 x 16, and give factory-perfect service in 24 hours! With only five 30-minute repair jobs a day, and an average \$3 profit to each job, you can clear \$15 profit in 2½ hours! That kind of business pays for the equipment in 2 weeks!

INLAND RUBBER CORPORATION

FIRST NATIONAL BANK BLDG., CHICAGO 3, ILLINOIS

Subsidiary of MINNESOTA MINING & MANUFACTURING COMPANY, ST. PAUL, MINN.



INLAND EQUIPMENT PROVED MOST PROFITABLE BY MORE THAN 5000 DEALERS

• You can't miss! The Inland Tire Repair Unit and vulcanizing materials have already been proved the most profitable equipment in the shop by more than 5000 dealers! And Inland is the only large manufacturer of both equipment and materials. Here's your opportunity to capitalize on the richest repair market in history! America's cars have got to have tire-repairs to keep rolling. Don't delay. Today—clip and mail the coupon below for complete information!

INLAND RUBBER CORPORATION
Dept. M5, First National Bank Building
Chicago 3, Illinois

Quick—tell me how I can get the Inland Dealership in my community!

Name.....

Address.....

City.....State.....

Virginia Licenses Dealers

THE dealer-licensing bill, sponsored by the Virginia Automotive Trade Association, was signed by Governor Darden April 4. Resembling the Wisconsin law, the Virginia statute regulates relations among Dealers, distributors, wholesalers, manufacturers, factory branches, factory or distributor representatives, and can salesmen.

Dealers, distributors, and wholesalers must pay a \$15 license fee for each principal place of business, plus \$5 for each car lot not immediately

adjacent to the principal place of business. The fee for a manufacturer's license is \$20, while each factory branch in Virginia must pay \$10 for a license. Factories, wholesalers, and distributors may operate as motor-vehicle dealers without the payment or additional fees. The fee for factory or distributor representatives is \$10, for retail salesmen \$2.

The state may deny, suspend or revoke a license for material misstatement in applying for a license or for filing a false tax return. A manufacturer, wholesaler or distributor is prohibited from attempting to induce

a dealer to sell or assign installment sales contracts to a specified finance company, and it is unlawful under the new act for a manufacturer or distributor to induce any dealer to accept delivery of any vehicle or part which has not been ordered.

Sees Service Upswing

The greatest challenge and opportunity in America's automotive history awaits the parts and service business in the immediate post-war world, it was predicted recently by Royce G. Martin, president of The Electric Auto-Lite Co., Toledo, Ohio.

Despite the fact automotive repair and service shops today are experiencing their greatest volume of business in history, the post-war era should eclipse present day demands, he stated.

Martin's prediction is based on evidence already significant in the automotive world, as well as the primary factor that following the ending of hostilities automobiles will be literally "driven to death."

"With the lifting of gasoline rationing and the other limitations on driving, motoring will become the number one pleasure of post-war America," Martin stated.

"Americans will want to see what has happened throughout the nation during the war. They will want to witness for themselves the scenic grandeurs opened to them by the Alcan Highway and the Inter-America Highway. People will actually flow from Alaska to the southern tip of South America in the family car.

According to leading automotive authorities, new cars will not replace all of those now in service for at least four years. Because of this, Martin stated, the cars that are on the road today will still be on the road after the war. But, he emphasized, the owners will immediately want peacetime performance from their automobiles.

Repair Parts

(Continued from page 82)

eral Motors Corp. told the Colmer (House) Post-War Committee on April 19 that General Motors will authorize the ordering of materials required to produce 1,000,000 cars and trucks and an equivalent quantity of other products it produces at the earliest possible date after the war ends.

On the same day, the Senate Military Affairs Subcommittee met to discuss legislation to provide WPB with control over surplus property and machinery and contract cancellations needed to deal with reconversion problems developed at the meeting on April 17 with automobile executives.



WAYNE AIR COMPRESSORS SERVING

Buy U.S.
War
Bonds

on Every Front!



HERE'S the way Wayne Compressors serve the mechanized forces when installed in Graco Convoy Lubers (made by the Gray Company, Inc., Minneapolis). Wayne Compressors are available to you under Government regulations. Our Nationwide Service is always at your call. Write for catalog.

THE WAYNE PUMP CO., FORT WAYNE 4, IND.

Wayne

AIR COMPRESSORS

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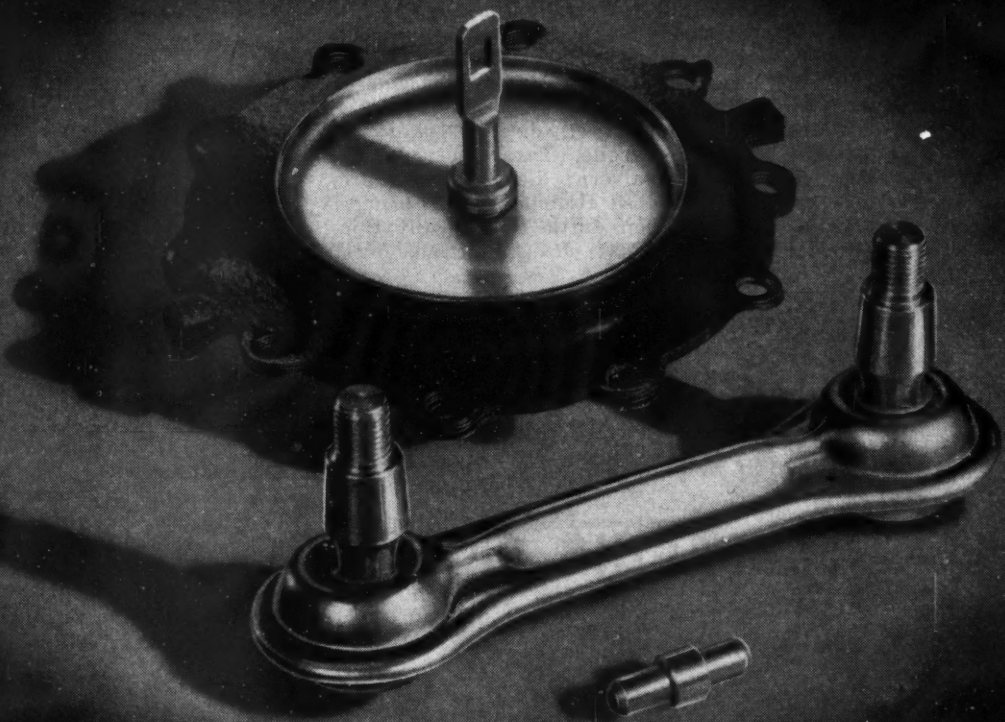
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"SECONDS" COUNT AGAINST THE WAR EFFORT.....
SO KREGER QUALITY IS MAINTAINED IN EVERY KREGER PART

"SECONDS," or substandard replacement parts, waste labor and precious war materials, disappoint their users by early breakdowns—in comparison, check the high quality of Kreger shock absorber links made of 16-gauge steel; fuel pump diaphragms of grade "A" airplane linen; rocker arm pins and bushings that are hardened and ground; battery hold downs that exactly duplicate original parts, or any of the other 250 Kreger items. All Kreger products are honestly built to original specifications and they always will be. Good jobbers—interested in giving you the best quality parts—sell Kreger products.

Larry Kreger



The L. F. Kreger Manufacturing Company, 544 W. 35th Street, Chicago 16, Illinois

Arkansas Dealers Elect

At the 11th annual meeting of the Arkansas Automobile Dealers Association held at Little Rock, April 12, O. A. Cook, of the Cook Automobile Co., Little Rock, was elected president. He succeeds Wm. H. Sadler, of the Sadler-Ross Motor Co., Little Rock.

W. Link Lewis, of Little Rock, was reelected secretary-manager. Gene McDavid, of El Dorado was elected vice president and Fred S. Balch, of Little Rock, treasurer.

L. Claire Cargile, of Texarkana, former state and NADA president,

was chosen Arkansas director on the board of the National Automobile Dealers Association.

New directors elected were: W. H. McCain, of Brinkley; Fred Balch, of Little Rock; M. S. Benson, of Little Rock; Ray West, of Pine Bluff; R. H. Patton, of Jonesboro; Ralph Smoot, of Fordyce; Mose Smith, of Fort Smith, and S. A. Wilcoxson, of Hamburg.

The holdover directors are: L. Claire Cargile, Texarkana; W. A. Colie, Malvern; Leo Griffin, Little Rock; Mose Holiman, Hot Springs; O. A. Coon, Little Rock; Tully Horner, Helena; J. C. McCaa, West

Memphis; Russell Phillips, Blytheville; Rabele Rhodes, Harrison; Wm. H. Sadler, Little Rock; A. H. Talkington, Russellville; G. M. McDavid, El Dorado; R. J. Ross, Fort Smith; H. C. Thomas, Little Rock, and H. F. Trotterm, Pine Bluff.

Johnson ODT Director

J. Monroe Johnson, member of the Interstate Commerce Commission, and former Assistant Secretary of Commerce (1935-1940) was named by President Roosevelt on April 4 to be new director of the Office of Defense Transportation, succeeding the late Joseph B. Eastman.

Johnson is a civil engineer in private life. He is a native of Marion, S. C., and a veteran of the Spanish-American and World Wars. He served overseas in World War No. 1 with the Rainbow Division with the rank of lieutenant colonel. Johnson has been a member of the Interstate Commerce Commission since 1940.

Johnson has appointed two new assistant directors, Guy A. Richardson and Henry F. McCarthy. Brig. Gen. C. D. Young, who was deputy director under Eastman, will continue in that capacity.

Richardson, previously was director of the ODT Division of Local Transport, was named assistant ODT director in charge of both the Division of Local Transport and the Division of Motor Transport. McCarthy, previously director of the Division of Traffic Movement, will have charge of that division as well as the Division of Railway Transport in his new capacity as assistant ODT Director.

Johnson also announced the resignation of John L. Rogers as assistant director in charge of the work and personnel of the Division of Motor Transport.

Army-Navy "E" Awards

Lodge & Shipley Machine Tool Co., Cincinnati, Ohio. (Fourth Star)

Aro Equipment Corp., Cleveland, Ohio. (Star)

Electric Storage Battery Co., Philadelphia, Pa. (Fourth Star)

Federal Motor Truck Co., Detroit, Mich. (Star)

Briggs Clarifier Co., Washington, D. C. (Star)

Continental Rubber Works, Erie, Pa. (Second Star)

Mack Trucks, Inc., Plainfield, and New Brunswick, N. J., and Allentown, Pa. (Second Star)

Named Tire Ad Chief

Henry A. Mackey has been appointed manager of advertising and sales promotion for the Gillette tire division of United States Rubber Co., it has been announced by W. D. Baldwin, Gillette sales manager.



Many older cars, apparently in need of costly repairs, are merely victims of that common ailment . . . a rusted, badly choked cooling system. This condition produces alarming signs such as overheating, knocking, sluggishness and excessive use of gas and oil. These symptoms are often mistaken for defects in the carburetor, lubrication or ignition system or faulty compression. Thousands of motorists still do not know this condition can be corrected easily by the use of

WARNER SERVICE CLEANER

. . . extra strength for trucks . . . heavy motors or badly neglected cars. Fast, non-poisonous.

Wartime demand makes it impossible to provide you with all the WARNER COOLING SYSTEM COMPOUNDS you need. Please be patient.

Manufactured under strict laboratory control . . . safe for all cars

WARNER COOLING SYSTEM COMPOUNDS. Here's your big chance to build new business and new friends . . . to perform a valuable wartime service.

WARNER RADIATOR CLEANER quickly and safely removes rust, scale, and muck from all parts of the cooling system . . . restores full circulation . . . gives new-car cooling efficiency. WARNER COOLING SYSTEM PROTECTOR is an inhibitor . . . it prevents rust and guards against harmful action of chemicals in the water.

WARNER LIQUID SOLDER

Repairs leaks in any part of cooling system quickly, permanently without mechanical aid.

WARNER-PATTERSON COMPANY, 920 S. MICHIGAN AVE., CHICAGO 5, ILL.



WARNER

COOLING SYSTEM

COMPOUNDS

STANDARD OF PROTECTION

New Synthetic Ceilings

(Continued from Page 40)

which few remain in stock for civilian use, are frozen at the Feb. 1, 1944, level.

The new regulations leave the general level of used-tire prices unchanged but eliminate the need to measure the remaining tread. All that is necessary is to determine whether a tire has a "continuous" trade design, is smooth, or is "worn into body plies."

Naphtha Rules Tightened

IN a move designed to curb the use of naphtha as a motor fuel, the Petroleum Administration for War has amended Petroleum Distribution Order No. 18 to tighten regulations governing its distribution and use. Dealers, especially in the Middle West, the PWA alleges, have been selling increased quantities of naphtha in cans marked "not for use in motor cars" and the naphtha has been used in their cars by purchasers. Further, says the PWA, dealers have been including some types of gasoline in the base volume upon which their naphtha quotas are computed.

The amendments to the order states these provisions:

Naphtha may not be used as a motor fuel.

Bulk consumers or dealers who apply for naphtha on a quarterly delivery quota basis cannot include any petroleum product handled as motor fuel during 1942 in computing current quotas.

Whenever a consumer or dealer finds that his naphtha quota is insufficient to meet current needs, he may obtain an increase by following the simple procedure set forth in the order.

Recent Rulings

UNDERGROUND TANKS. Sales of used pressure vessels and enclosed atmospheric pressure vessels, which are installed underground and purchased for use in their present location, were exempted from price control April 7.

FARM AGENT GAS. Full-time paid employees of farm organizations operating to increase the production of food have been made eligible for preferred mileage under gasoline rationing.

GAS PUMPS. Installation of additional tankage at any service station, bulk plant, or consumer location is now permitted by the PAW when this will effect a 25 per cent or more saving in the mileage of tank trucks supplying the location. The requirement that five-year-old dispensing pumps

which are replaced by other pumps must be scrapped has been eliminated.

GAS COMMISSION. Firms or persons who sell petroleum products to the farm trade through commission agents may pay commission as agreed upon between the principal and agent, the OPA has ruled, but the increased amounts paid must be absorbed by the seller so that no increase in price to the farmer will result.

VIBRATION DAMPERS. An amendment to Rubber Order R-1 forbids the use of crude rubber or natural latex

in non-bonded torsional vibration dampers. Since synthetic rubber, at the present stage of development, is not suitable for bonded dampers, crude rubber or natural latex may still be used in this type.

JACKS. A new definition of "capacity" as applied to jacks has been adopted by the WPB. The word now means in WPB language the "load raising ability through the entire jacking range from minimum to maximum height." Limitation Order L-270 governing the production of shop equipment limits production of

(Continued on Page 122)



● Inspect the coil, condenser, distributor assembly, cables, voltage regulator, generator and other vital parts in the circuit on every car. Tighten loose connections. Free contacts of dirt, grease, oil and corrosion. Stop needless wear before it starts.

Where ignition units are beyond servicing—repair with NIEHOFF Approved Quality Products that protect the battery, conserve gas and oil, assure quicker starting and new car performance. NIEHOFF Ignition Parts, Starter and Generator Brushes, Magneto Parts, and Hydraulic Brake Parts are available through a national network of NIEHOFF Jobbers.

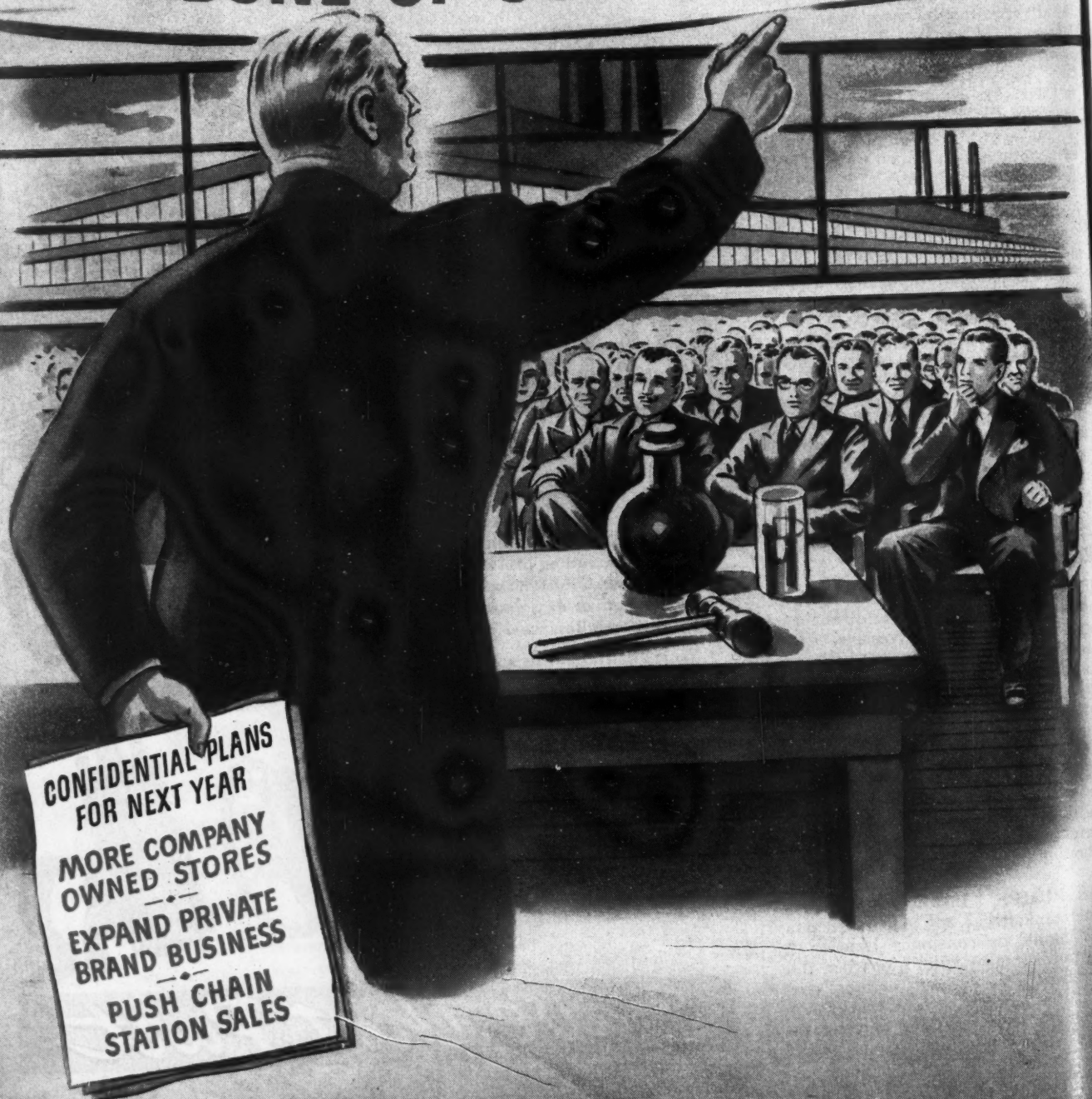
C. E. NIEHOFF & CO.

4925 Lawrence Ave. Chicago 30, Illinois
Branch: 1342 S. Flower St., Los Angeles 15, Calif.

Save that Part

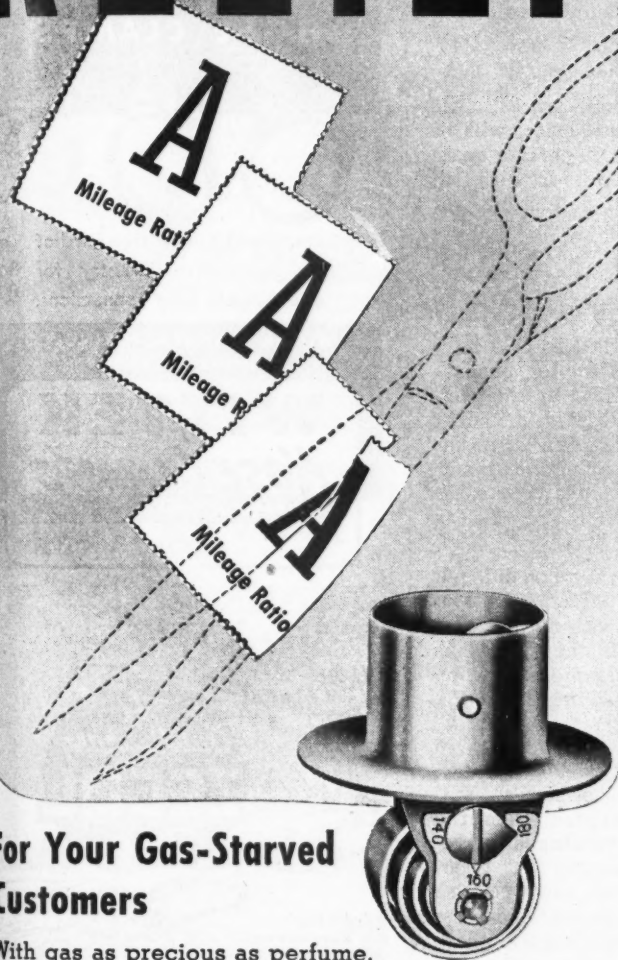
Remember when.

**THE INDEPENDENT DEALER IS THE
BACKBONE OF OUR BUSINESS**



**CONFIDENTIAL PLANS
FOR NEXT YEAR
MORE COMPANY
OWNED STORES
—•—
EXPAND PRIVATE
BRAND BUSINESS
—•—
PUSH CHAIN
STATION SALES**

RELIEF



For Your Gas-Starved Customers

With gas as precious as perfume, you do your customers a service when you suggest a Dole Replacement Thermostat.

The original thermostat is installed by the car builder to maintain the most efficient operating temperature for the motor—preventing sludge, excessive cylinder wear—saving oil and gasoline. As moving parts, thermostats are subject to wear, need replacement to keep gas mileage up, with quick warm-up and good pick-up.

Customers understand this readily. It's a favor as well as a sale when you show them the need for

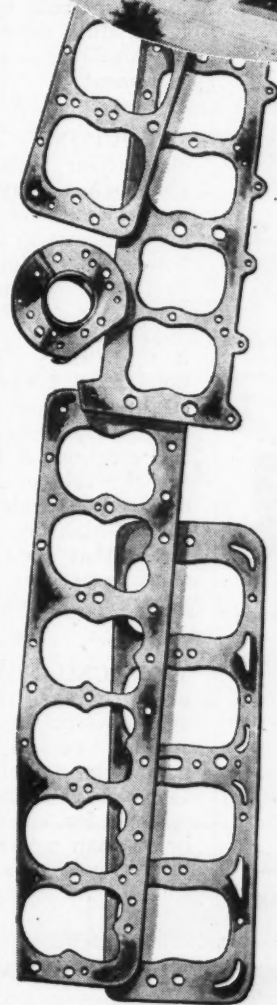
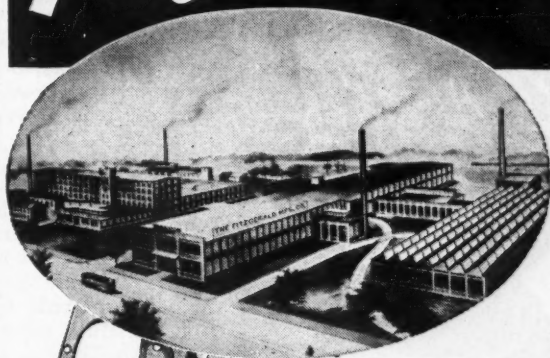
DOLE

Replacement THERMOSTATS

THE DOLE VALVE COMPANY
1901-1941 Carroll Avenue, Chicago 12, Illinois
Representatives in Principal Cities

Fitzgerald

THE BIG NAME
IN GASKETS



For 38 years, Fitzgerald has been building gaskets of highest quality — gaskets that insure tight, leakproof joints and help maintain motor performance at high efficiency.

Today, Fitzgerald gaskets meet every demand of high speed, high compression motors. They are especially designed for modern heavy duty service — for continuous running hour after hour, day after day.

The complete Fitzgerald line includes gaskets and grease retainers to meet your every need. Ask your jobber for full details.

The Fitzgerald Manufacturing Company, Torrington, Conn.—Branches, Chicago and Los Angeles — Canadian FITZGERALD, Limited, Toronto.

FITZGERALD GASKETS

SINCE
1906

THE COMPLETE LINE THAT COMPLETELY SATISFIES



CHECK THE BEARINGS TOO!



LINK-BELT ROLLER BEARINGS

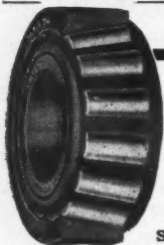
Important aid to keeping motor transport functioning. Avoid costly bearing failures—and replace with free-rolling, self-aligning LINK-BELT Roller Bearings.

Made by makers of famous LINK-BELT Silverstreak Silent Timing Chain.

9457

LINK-BELT COMPANY

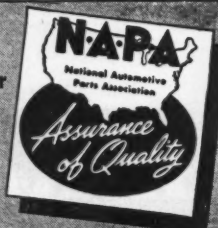
519 N. Holmes Ave., Indianapolis, Ind.
Warehouses in all principal trading centers



The cost and time required to install a genuine Timken Bearing are exactly the same as any tapered roller bearing.

THE TIMKEN ROLLER BEARING COMPANY
CANTON, OHIO

See Your
NAPA Jobber
For Prompt
Service on
Automotive
Parts!



A Nation-Wide Organization of
Independent Warehousing Distributors

NATIONAL AUTOMOTIVE PARTS ASSOCIATION
Executive Offices: 705 Fox Building, Detroit

Recent Rulings

(Continued from page 89)

jacks according to capacity. The WPB declares some manufacturers have interpreted the provision as referring to "sustaining capacity."

* * *

TRUCK TIRES. Small trucks, used to deliver essential products, will be eligible for new tires in certain sizes, the OPA has announced, with all small trucks becoming eligible for used tires. Previously, even essential small trucks were permitted to buy only used tires.

* * *

TRUCK RESALES. Trucks that have not been used except for the purpose of sale may not be resold by the original buyer at the price paid, including increment paid by him, the OPA has ruled. Until the new ruling was made, the resale price could not include the increment.

* * *

T COUPONS. Users who did not claim their second-quarter "T" coupons before May 1 will not be able to obtain them until the ODT has had a chance to reexamine the ration holder's need for gasoline, the OPA announced last month.

* * *

R COUPONS. Kansas service stations have been exempted from the OPA regulations preventing most retail outlets from accepting "R" gasoline coupons. A Kansas law provides for the sale of tax-exempt gasoline by licensed dealers to licensed users for off-highway use. The OPA explains that state supervision is sufficient to prevent the use of "R" coupons for highway vehicles.

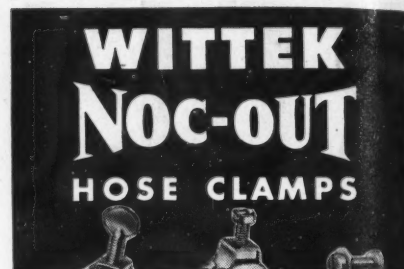
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TIRE CEILINGS. Dollar-and-cents price ceilings have been placed on synthetic-rubber tires and tubes for sale to vehicle manufacturers for mounting on equipment sold by them. The average is 22 per cent above the ceilings for natural-rubber tires but lower than prices heretofore permitted for synthetics.

CLASSIFIED ADVERTISEMENT

WANTED

Major oil company wants man with personnel and industrial relations experience for permanent position of Supervisory Training Conference Leader in Midwest. State age, experience, education, draft status. Those in essential industry need not apply. Availability certificate required. Box 14, Motor Age, 56th & Chestnut Streets, Philadelphia 39, Pa.



For over 20 years standard of the automotive industry for dependable hose connections.

WITTEK MANUFACTURING CO.
Chicago 23, Illinois

WITTEK
Hose Clamps
Dependable Hose Connections



They're keeping them looking new....

The Quick and Easy Way

ZECOL

ZECOL Inc.
Sole Manufacturers
Milwaukee, Wis.

Buffalo MUFFLERS

Stop that Noise!

BUFFALO PRESSED STEEL CO., INC., YOUNGSTOWN, OHIO

GLOBE

SPINNING POWER
TRADE MARK REG.

MA-544 **BATTERIES**

built for REPLACEMENT SERVICE
GLOBE-UNION INC., MILWAUKEE, WIS.



"Aero-Seal" HOSE CLAMPS

Distinctive worm gear tightening action provides powerful belt-like pull-up. Uniform pressure all around prevents leaks. Can be put on or taken off hose in place on pipe. Can be re-used. No loose parts. Compact design. Extremely long take-up. Made in sizes from 1/2" up. Write for circular.

Aircraft Standard Parts Co.
1709 E NINETEENTH AVE., ROCKFORD, ILL.



KNOCK-OUT UTILITY VALVE SEAT GRINDERS are in a class by themselves. Light, fast and accurate, simple and efficient to operate. The K-O UTILITY VALVE SEAT GRINDER with all attachments costs no more than other single purpose seat grinders.

See your nearest K-O jobber or write for Bulletin No. 5-54

The tool with 101 uses!

- * Grinds valve seats
- * Carbon removing
- * Tool post grinding
- * Abrasive disc grinding
- * Miscellaneous hand grinding

GATKE

Custom-Bilt

BRAKE BLOCKS & LINERS

for Cars, Trucks, Trailers, Buses, etc.

Ask your GATKE Jobber or write
GATKE CORPORATION 228 N. La Salle St., Chicago 1, Ill.



YOU CAN BEND AND TWIST IT!

DRESSES and cleans all electrical parts and contacts, including commutators, spark plug points, etc. Very thin. When used on spark plugs will not cause widening or distortion of gap. "Cuts" and smooths hardest of metals. Flexible—works in confined spaces. Won't break when bent and twisted. No short circuit. Size 4 1/4" x 3/8". List 15c each. Ask your Jobber for Rimac Flex-Stone.

CONTACT POINT DRESSER
smooths hardest tungsten and platinum-iridium points.

RINCK-McILWAINE, Inc., 16 HUDSON ST., NEW YORK 13, N. Y.

Be 100% with 10%
Buy War Bonds

K. O. LEE CO.

ABERDEEN, SOUTH DAKOTA

DON'T LET YOUR CUSTOMERS WASTE RUBBER

To keep them rolling every possible ounce of rubber that can be saved must be. Show your customers how balancing each wheel will stop excessive wear and tear on tires, and let them see why "SNUGLS", the streamlined balance weights with the dove-tailed clip, that grips steel against steel on each side of the rim flange, is the answer. Easy to install they cannot rattle or work loose. Sizes 1/4 oz. to 6 oz. for passenger cars—4 oz. to 1 1/2 lbs. for trucks, buses, etc. Contact your Jobber or write us direct.



Manufactured by
MID-WESTERN AUTO PARTS, 824 E. Elm St., Kokomo, Ind.
Western Distributor: Kenneth V. Mills, 910 W. Pico Blvd., Los Angeles, Cal.

NEW! A "ONE MAN" Toe-In Measuring Gauge!

\$5.95



Quicker and Easier to Use!

The Micro-Linor Toe-In Measuring Gauge requires only one man to operate it. Just attach the grippers to the rims and take front reading. Then roll vehicle forward and take rear reading.

Quicker — because gauge remains in same spot for both readings. All done in less than 2 minutes. Simple. Extremely accurate. Fits any vehicle. Every mechanic should own one.

Micro-Linor Service Corporation
1623 W. Fort St. Detroit 16, Mich.

WRITE FOR CATALOG

The Standard
OF BATTERY TESTING
INSTRUMENTS

Edelmann
No. 40 and 55 Thermo
"Break-Not" Hydrometers

Most dependable and accurate.
Over 500,000 in service. Tests
storage batteries in cars or
on the line. No. 55 especially
designed for use in con-
junction with Rapid Battery
Chargers.

YOUR JOBBER WILL
QUOTE PRICES

E. EDELMANN & CO.
CHICAGO • ILLINOIS

? DO YOU KNOW ?

... what motor oil has been used
by Pan American Clippers for over
14 years and more than one
billion passenger-miles?

WOLF'S HEAD

100% Pennsylvania 35c a quart
Wolf's Head Oil Refining Co. Oil City, Pa.

AHLBERG
GROUND
BEARINGS

**SAVE STEEL,
are GUARANTEED
and COST LESS!**

Ask Your Jobber or Write Us
AHLBERG BEARING COMPANY
3028 WEST 47TH STREET, CHICAGO, ILL.

THERE IS A GUARANTEED

Pedrick

ENGINEERED SET
of PISTON RINGS
FOR EVERY CAR, TRUCK,
BUS, AND TRACTOR

Clement O. Miniger

Clement Orville Miniger, 69, founder and chairman of the board of The Electric Auto-Lite Company, died at Toledo, Ohio, April 23 following an illness of several months. Funeral services and burial were in Toledo.

Beginning as a traveling drug salesman, Mr. Miniger founded an industry that today extends from coast to coast.

He was born at North East, Pa., the son of Samuel O. and Clementine Sherman Miniger. About the time he graduated from grammar school, he moved with his parents to Fostoria, Ohio, where he received his high-school education. Upon completion of this training, he attended a pharmacy college in Chicago.

In 1911, Miniger founded The Electric Auto-Lite Co.

Becomes Sales Aide

I. M. Olson, general sales manager of the WHIZ Automotive Division of R. M. Hollingshead Corp., Camden, N. J., announces the appointment of V. P. Bresan as assistant sales manager of that division.

Bresan joined the Hollingshead organization in 1934 as assistant to W. Stewart Hollingshead, at that time sales and general manager of the company's Canadian subsidiary. In 1939, he was made assistant to Olson.

Holds Sales Meeting

Grizzly Manufacturing Co.'s 1944 sales convention was held March 20-22, with 100 per cent attendance, including engineering, production and administration executives.

After breakfast inspection of the new Paulding plant, the convention went into full swing at Fort Wayne, opening with a discussion of product and processes conducted by Del Graham, head of Grizzly engineering staff. The next day's meetings included discussions of Grizzly's war production, aircraft developments; export sales, and warehousing. Wednesday, Sales Manager Joe Brown reviewed the forward strides in Grizzly sales and presented new plans for 1944.

**COLD WELD YOUR
CRACKED BLOCKS & HEADS
BY THE K&W METHOD**



KERKLING & COMPANY • BLOOMINGTON, IND.
West Coast Office:
6516 Selma Ave., Hollywood 28, Cal.

BUELL AIR HORNS

AVAILABLE ON PRIORITY

Manufacturers of High Pressure Air Horns for cars, trucks, busses, boats and railway trains since 1912, our production is now devoted entirely to the War Effort. After Victory Buell Air Horns will again be available for old and new cars.

BUELL MANUFACTURING CO.
2991 Cottage Grove Ave., Chicago, Illinois

Make Big Profits on Small Investment in

**SHURHIT
IGNITION
PARTS**

Ask your Shurhit jobber or write us for details on General Ignition Assemblies of fast-moving parts . . . Contact Points . . . Condensers . . . Rotors . . . Caps . . . Coils . . . Switches, etc.

SHURHIT PRODUCTS, INC.
Waukegan, Ill.

**LINCOLN
LUBRICATING
EQUIPMENT**

plays an important part in
WAR PROGRAM

by providing fast, thorough, and economical lubrication of cars, trucks, buses and other motor vehicles so important in the transportation of war materials and men engaged in war production. Ask your nearest jobber, or write us for details on this equipment.

LINCOLN ENGINEERING COMPANY
General Offices, St. Louis, Mo.
A 41-13

**BUY
WAR BONDS
NOW!**

Keep Your present HALL EQUIPMENT performing like new. Service Parts and Factory Reconditioning IMMEDIATELY AVAILABLE. Ask your Jobber or write the Factory for Information.

THE HALL MANUFACTURING CO.
TOLEDO, OHIO

BALDOOR

ST. LOUIS, MO.

**BATTERY CHARGERS
BATTERY TESTERS
SHOP GRINDERS
ELECTRIC MOTORS**

SORRY, SARG, I TRIED TO PUSH THEM OUT OF THE WAY, BUT SHE HAS -

SOUTHERN BRAKE LINING

REG. U. S. PAT. OFF.

SOUTHERN

FRICITION MATERIALS CO. - CHARLOTTE, N. C.

FOR WARTIME LUBRICATION

... YOU NEED AND CAN STILL GET

★ **DOOR-EASE**
STAINLESS STICK LUBRICANT
DRIPLESS OIL

★ **RUGLYDE**
RUBBER LUBRICANT
from leading Jobbers

AMERICAN GREASE STICK CO.
MUSKOGON, MICHIGAN

Kanzler Heads Finance Co.

Ernest C. Kanzler, who directed the program for converting the vast automobile industry to war production, has been elected chairman of the board of the Universal C. I. T. Credit Corp., it was announced April 12.

The announcement was made by Arthur O. Dietz, president of commercial Investment Trust Corp., parent company of Universal C. I. T., which specializes in financing the sale of automobiles.

Haggerson President

At a meeting of the board of directors April 25, Fred H. Haggerson, vice president and director, was elected president of Union Carbide and Carbon Corporation, succeeding Benjamin O'Shea who has been president since 1941 and now becomes chairman of the board.

Haggerson has been associated with Union Carbide and Carbon Corp. for 25 years.

Dealers to Meet

Mrs. Bessie B. Phoenix, of Raleigh, N. C., executive secretary of the North Carolina Automobile Dealers Association, has just announced that the association will hold its annual convention at Asheville, N. C., June 4-6.

Convention dates and site were selected at a meeting of the association's board of directors just held at Charlotte, N. C., and the program for the convention now is being arranged.

The Grove Park Inn at Asheville will be convention headquarters.

BLUE CROWN HUSKY

Controlled Heat Zone
SPARK PLUGS

The Vital Impulse that Sparks the Engines of War

A BLUE CROWN FOR EVERY PURPOSE IN WAR OR PEACE

Ask your Jobber

MOTOR MASTER PRODUCTS CORP.
1800 Winnemat Ave., Chicago 40, U.S.A.
Export Distribution
Borg-Warner International Corp., Chicago

HEADQUARTERS

MOOG

SPRING SUSPENSION SERVICE

ELECTRICALLY
HEAT TREATED
SPRINGS

COIL ACTION
REPLACEMENT PARTS
for
COMPLETE SPRING
SUSPENSION SERVICE

MOOG INDUSTRIES, INC., ST. LOUIS 14, MO.
ST. LOUIS SPRING CO. MOOG COIL ACTION PARTS CO.
MOOG PISTON KING COMPANY

GENERATOR RE-BUILDERS!

GET HASCO'S QUOTATIONS FIRST for top quality, reconditioned used parts.

Armatures	Bolts
Fields	Field Poles
Housings	Washers & Spacers
Drive Housings	Commutators
End Plates	Cores
Pulleys	Drives

V 8 Coils 35-36

Complete units suitable for rebuilding. We stock only genuine used parts. All are thoroughly tested and cleaned with the most modern methods and equipment. Each part carries our money-back guarantee.

HASCO PRODUCTS, INC.
131 Park Ave. (B) Lyndhurst, New Jersey

"Largest dismantlers and salvagers of Automotive Generators and Starters"

TAPERED ROLLER BEARINGS

Tyson

ROLLER BEARING CORP.
MASSILLON, OHIO

Repair
ENGINE CRACKS
in
30 MINUTES!

FAST! EASY TO USE!
No special equipment or training needed with Wonder Seal. Write for Folder.

OFTEN IMITATED
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